

**REQUEST FOR
ACTION BY:
TOWN OF CLARENCE, N.Y.**

☒ Appeal Board
☐ Planning Board
☐ Town Board

☒ Appeal
☐ Rezone
☐ Revise Ordinance
☐ Subdivision
☐ Limited Use Permit
☐ Other

Rec'd. by: Jonathan Bleuer

Date February 25, 2015

Action Desired Applicant requests a variance of 18' 3" to allow for a 26' 9" setback for an addition to the principle structure located at 4240 Shimerville Road. Principle structure located within the Residential Single Family Zone.

Reason

Town Code Reference:

§229-52 (3) : established front yard setback of 45'

PLEASE PRINT

Name	Don Rugg		
Address	4240 Shimerville Road		
	Clarence	NY	14031
Town/City		State	Zip
Phone	913-0813		
Signed	SIGNATURE ON FILE		

Requests for action on zoning should be filled out completely in above spaces if practicable; otherwise give brief description and refer to attached papers. The complete request with all necessary plans, maps, signatures, should be filed with the Secretary of the Planning Board. Requests (except appeals) may be filed with the Town Clerk or Town Board, but will generally be referred to Planning Board with subsequent loss of time

Initial Action

Approved ☐
Rejected ☐ by on 20.....
Approved ☐
Rejected ☐ by on 20.....
Published (Attach Clipping) on 20.....
Hearing Held by on 20.....

Final Action Taken

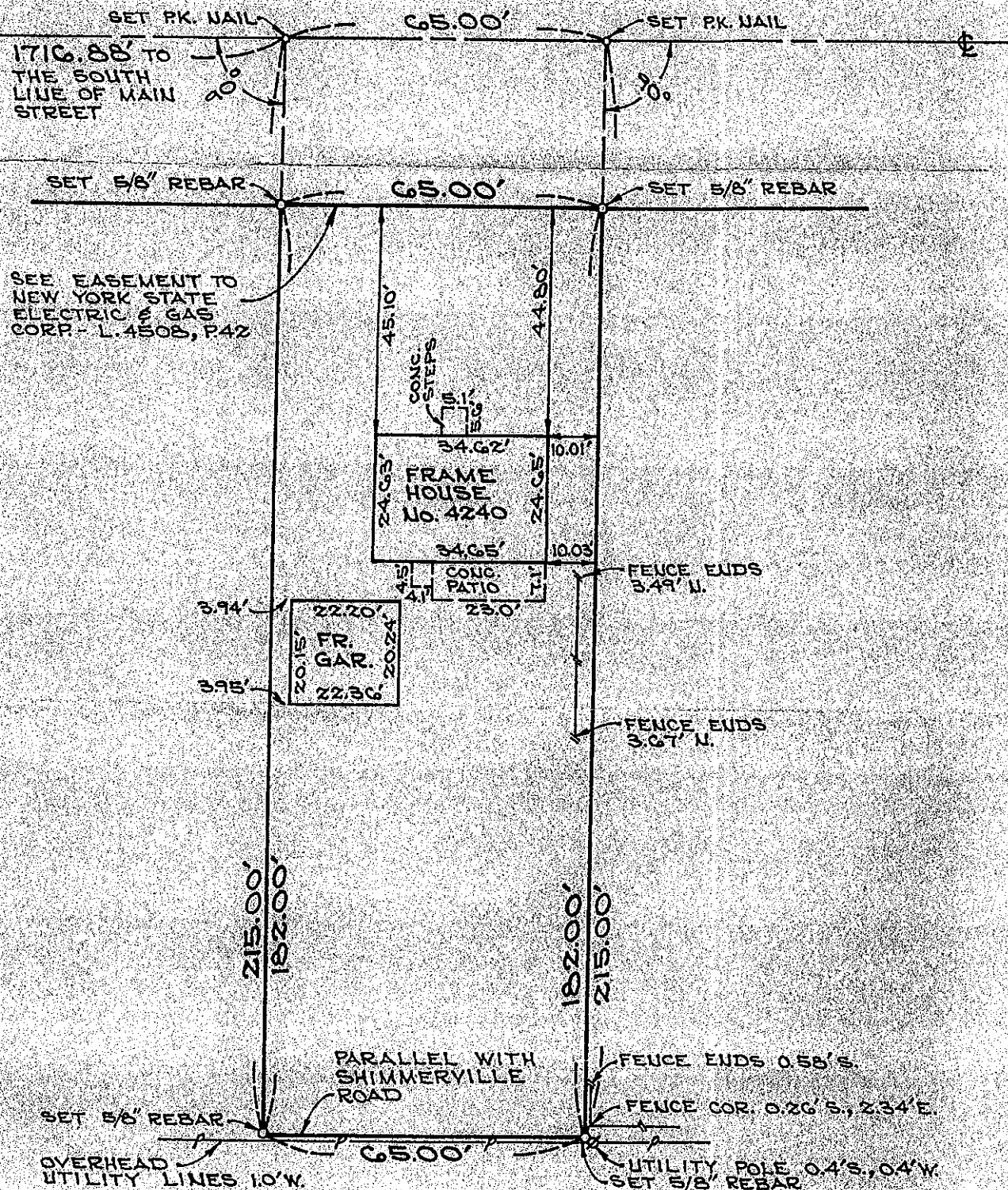
Approved ☐
Rejected ☐ by on 20.....
Published (Attach Clipping) on 20.....
Filed with Town Clerk on 20.....
Filed with County Clerk on 20.....



4240 Shimerville Road



SHIMMERVILLE (66' WIDE) ROAD



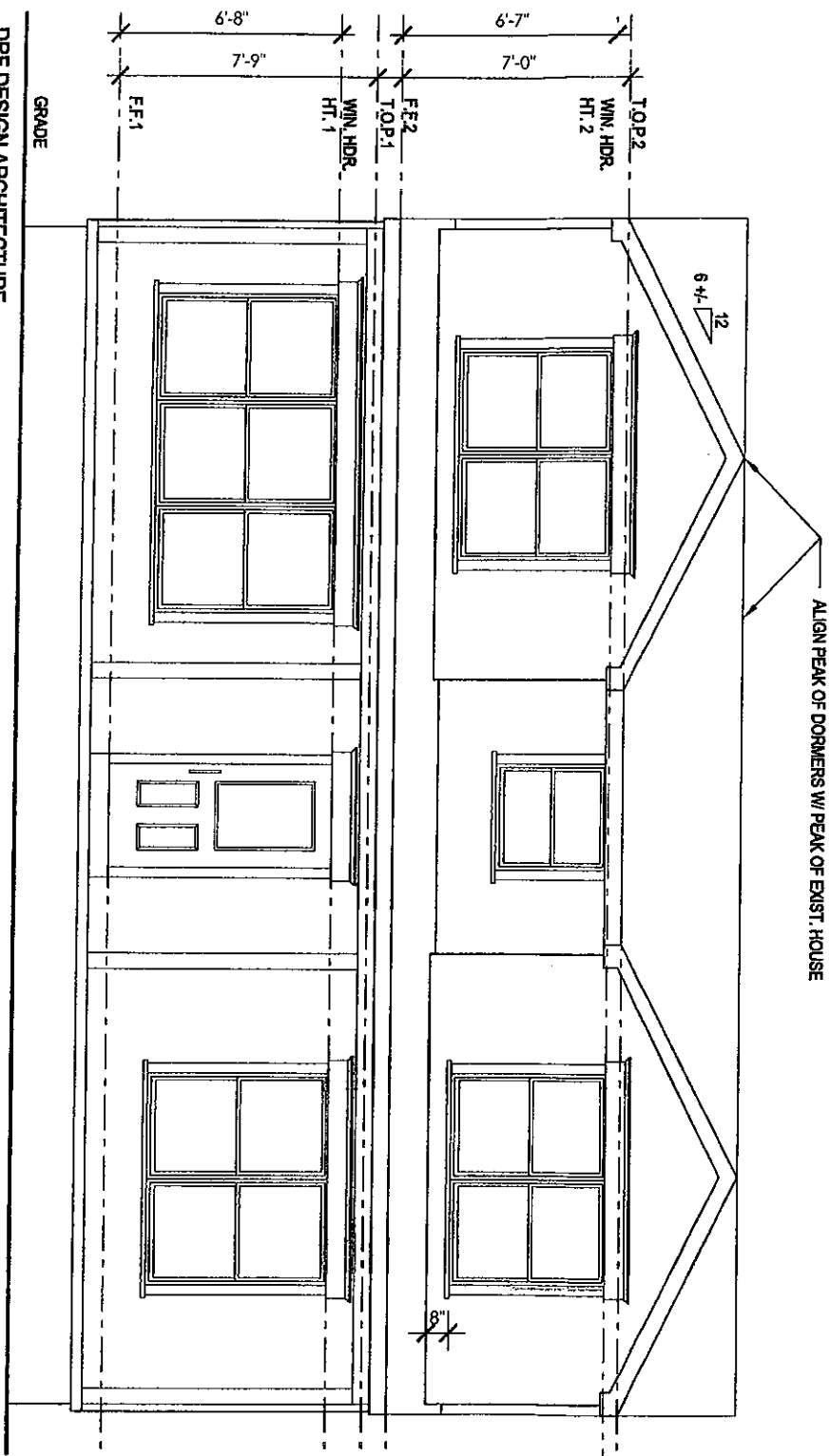
SURVEY OF
PART OF LOT 9, SECTION 9, TOWNSHIP 12, RANGE 6
HOLLAND LAND SURVEY
TOWN OF CLARENCE, ERIE COUNTY, NEW YORK

Bernard F. Wells

DATE

REVISION/TYPE

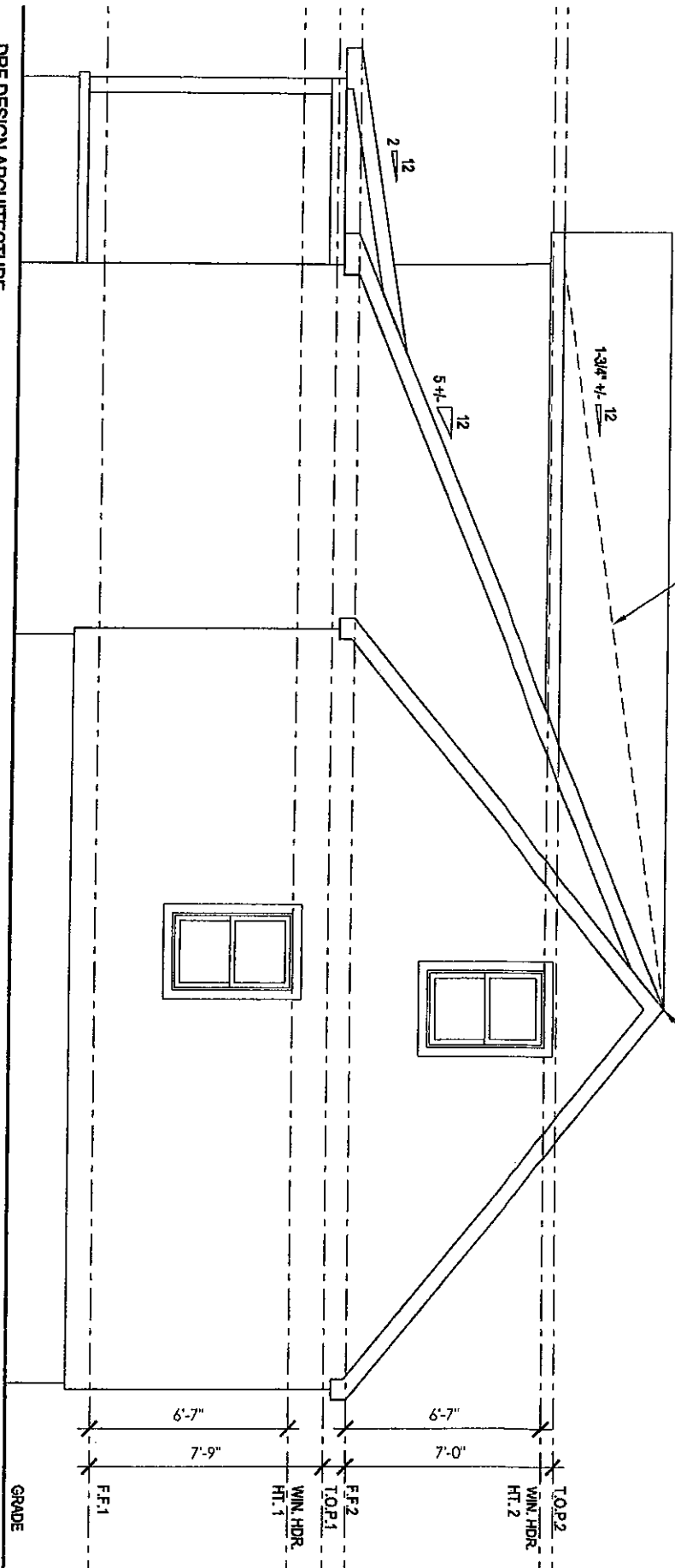
John D. Pratt & Co. Inc. Associated



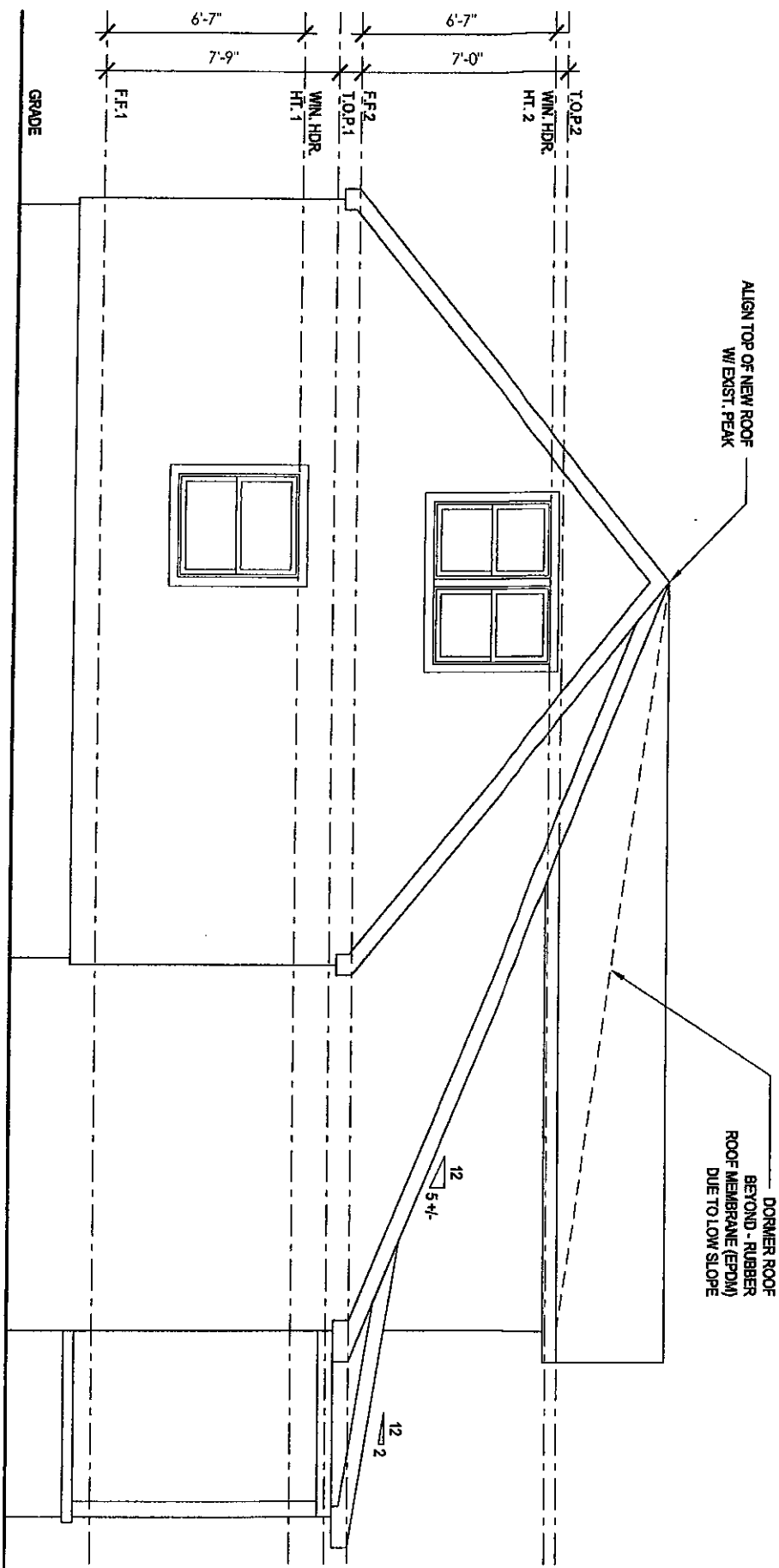
DRF DESIGN ARCHITECTURE
 PROPOSED ADDITION TO RUGG RESIDENCE
 JOB #14-148 - 4240 SHIMMERVILLE RD
 EAST ELEVATION
 TOTAL AREA OF ADDITION: 592 SQ. FT.
 SCALE: 3/16" = 1'-0"

DORMER ROOF
BEYOND - RUBBER
ROOF MEMBRANE (EPDM)
DUE TO LOW SLOPE

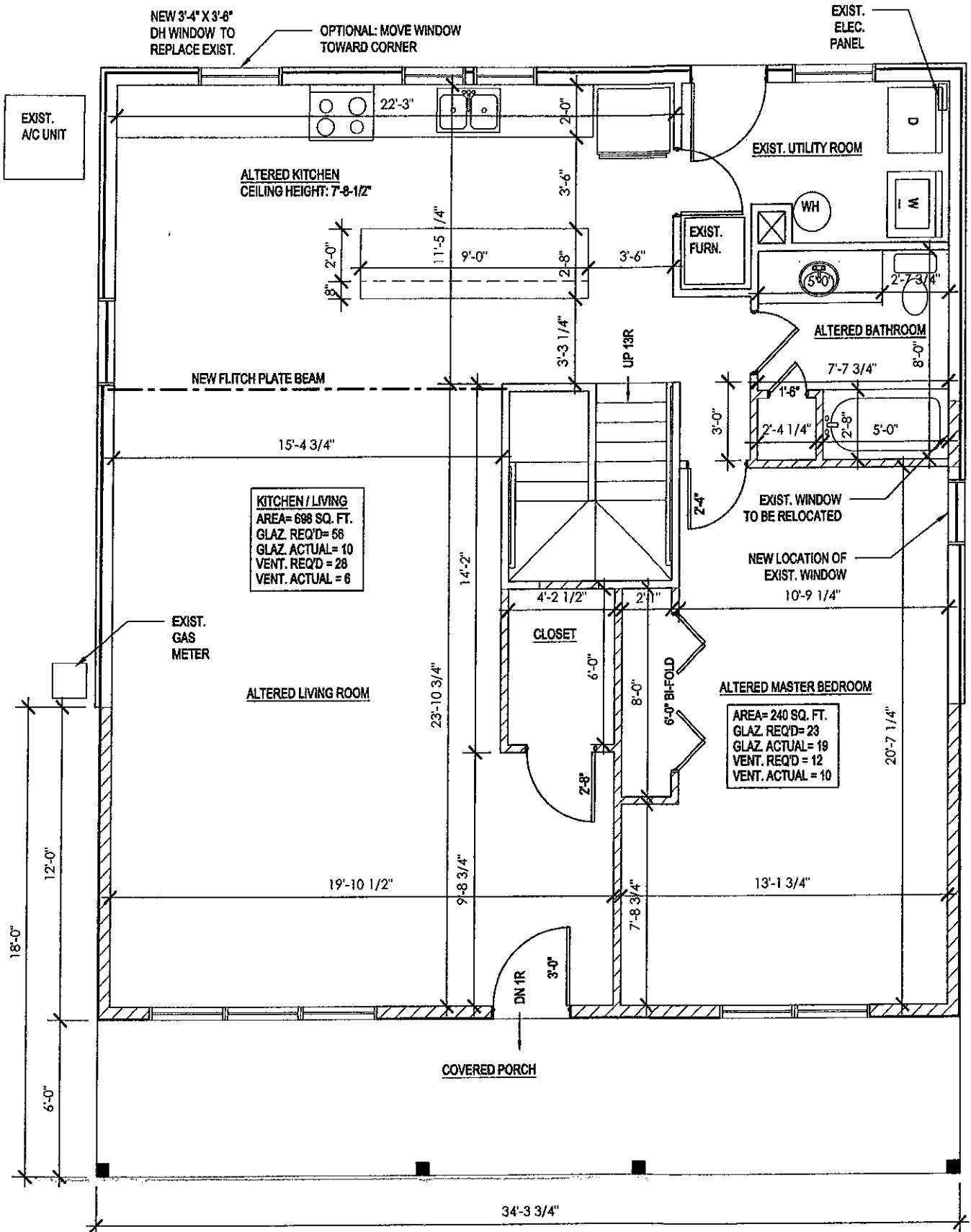
ALIGN TOP OF NEW ROOF
W/ EXIST. PEAK



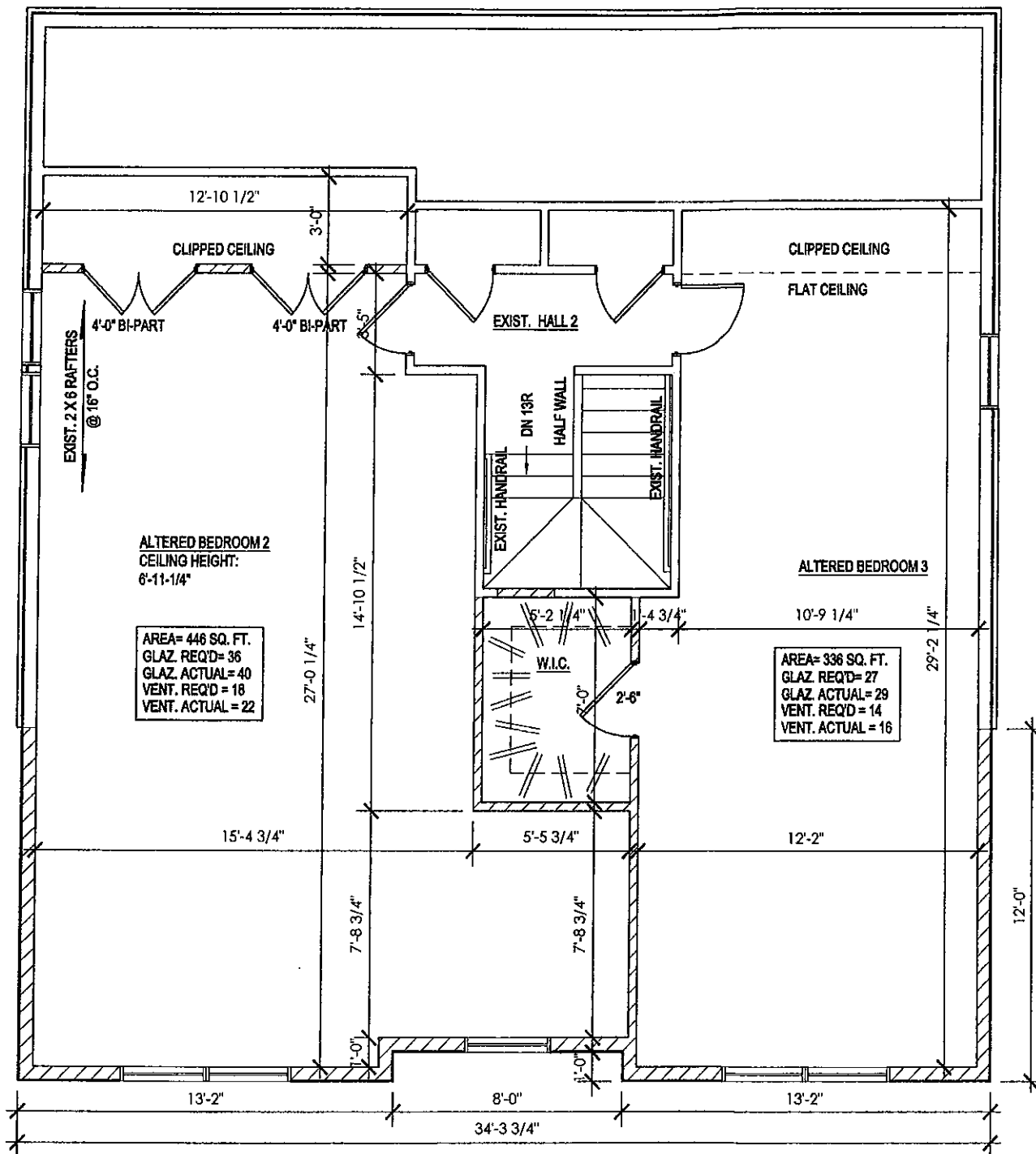
DRF DESIGN ARCHITECTURE
PROPOSED ADDITION TO RUGG RESIDENCE
JOB #14-148 - 4240 SHIMMERVILLE RD
NORTH ELEVATION
TOTAL AREA OF ADDITION: 592 SQ. FT.
SCALE: $3/16" = 1'-0"$



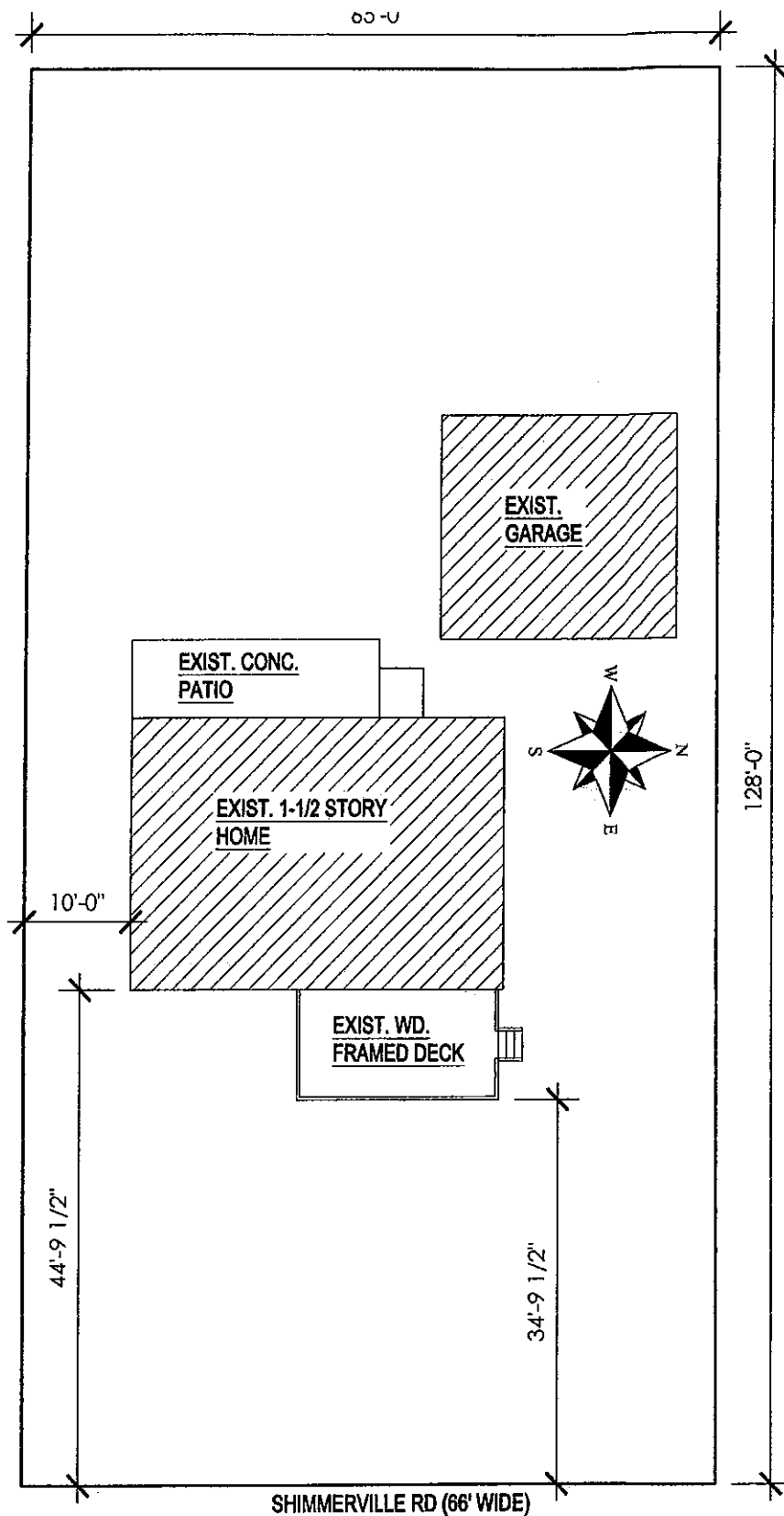
DRF DESIGN ARCHITECTURE
 PROPOSED ADDITION TO RUGG RESIDENCE
 JOB #14-148 - 4240 SHIMERVILLE RD
 SOUTH ELEVATION
 TOTAL AREA OF ADDITION: 592 SQ. FT.
 SCALE: 3/16" = 1'-0"



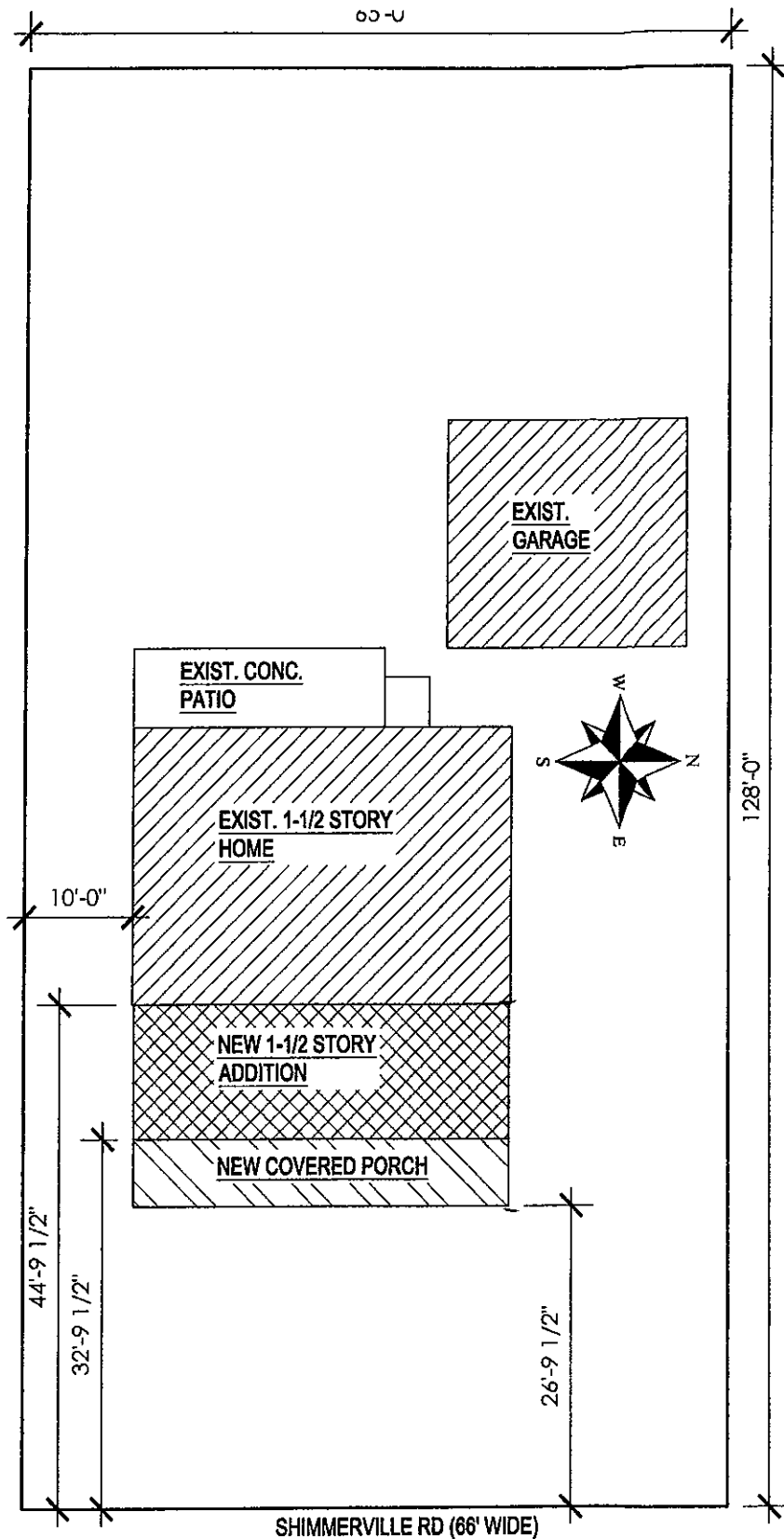
DRF DESIGN ARCHITECTURE
 PROPOSED ADDITION TO RUGG RESIDENCE
 JOB #14-148 - 4240 SHIMERVILLE RD
 FIRST FLOOR PLAN
 AREA OF FIRST FLOOR ADDITION: 412 SQ. FT.
 TOTAL AREA OF ADDITION: 592 SQ. FT.
 SCALE: 3/16" = 1'-0"



DRF DESIGN ARCHITECTURE
 PROPOSED ADDITION TO RUGG RESIDENCE
 JOB #14-148 - 4240 SHIMERVILLE RD
 SECOND FLOOR PLAN
 AREA OF SECOND FLOOR ADDITION: 296 SQ. FT.
 TOTAL AREA OF ADDITION: 592 SQ. FT.
 SCALE: 3/16" = 1'-0"



DRF DESIGN ARCHITECTURE
PROPOSED ADDITION TO RUGG RESIDENCE
JOB #14-148 - 4240 SHIMMERVILLE RD
EXISTING SITE PLAN
TOTAL AREA OF ADDITION: 592 SQ. FT.
SCALE: 1/16" = 1'-0"



DRF DESIGN ARCHITECTURE
 PROPOSED ADDITION TO RUGG RESIDENCE
 JOB #14-148 - 4240 SHIMMERVILLE RD
 NEW SITE PLAN
 TOTAL AREA OF ADDITION: 592 SQ. FT.
 SCALE: 1/16" = 1'-0"



Town of Clarence
Planning and Zoning Department
One Town Place
Clarence, NY

RECEIVED

FEB 23 2015

ZONING OFFICE

Re: Variance Request for Small Wind Energy Conversion Devices – Patrick Spoth

Sustainable Energy Developments, Inc. (SED) on behalf of one Town resident, Patrick Spoth, is submitting this Application Package for Variance Requests associated with the proposed installation of two (2) small agricultural wind energy systems to be located at 9300 Wolcott Road in the Town of Clarence. The wind turbines will offset electric consumption for the existing barn and commercial farming operations onsite and the adjoining residence located at 9270 Wolcott Road. SED is a NYSERDA approved wind turbine installer and has installed over 30 Bergey 10kW wind turbines in New York State, and recently completed the permitting process for the Maple Row Farm small wind energy system, the same system proposed herein.

The proposed installations will consist of Bergey Excel 10kW wind turbines on 140' steel, lattice, self-supporting towers. Additional details related to the proposal, as well as supplemental information required for a permit are included. Please let me know if you have any questions about the project and wind energy in general and whether there are additional details we can provide.

Thank you for your assistance,

A handwritten signature in black ink, appearing to read 'Matt Vanderbrook', is written over a light blue horizontal line.

Matt Vanderbrook
Project Manager
Sustainable Energy Developments, Inc.

Cell: (585) 406-1180
Work: (585) 265-2384
Email: matt@sed-net.com

Cc: Patrick Spoth
File

**POWERING
YOUR FUTURE**

☎ 877 WIND NRG
☎ 585 265 1148

317 Route 104
Ontario, NY 14519

Project Description:

The proposed project consists of the installation of two (2) residential-scale on-site wind turbines to be located at 9300 Wolcott Road (SBL18.00-1-17.1). One wind turbine will offset electricity for meters associated with the existing barn and agricultural operations on-site, the second wind turbine will offset electricity for the existing residence on the adjoining parcel, with an associated address of 9270 Wolcott Road (SBL18.00-1-17.2). Both parcels are under the same ownership. The wind turbines are Bergey Excel 10kW wind turbines on 140' self-supporting or free standing steel, lattice, towers. The maximum overall height of the systems including the tower, turbine and longest reach of the rotor blades will be 154'. The properties have a designated use of Rural-Residential and are located within the Clarence-Newstead Agricultural District #14.

The proposed location of each wind turbine was chosen primarily for access to wind resource, current use of available land, distance for setbacks, ease of construction, and land ownership scenarios. Turbine 1 is located approximately 95' from the nearest property boundary to the east, however the adjoining parcel is under the same land ownership of Patrick and Charlene Spoth and the landowners waive their right for a setback of the tower height from first property line for the sake of the installation providing more than ample setback to the next property line, greater than 500'. Turbine 2 is located approximately 430' from the nearest property line to the west not owned by the Spoth's. The project area is classified as rural; the primary parcel under consideration for development is comprised of 29.2 acres. The nearby area is predominantly agricultural use and single family residences, as well as a church and cemetery to the northeast. A preliminary site plan showing the location of the wind turbines in relation to the property lines and on-site buildings is attached.

Adjoining Parcels To 9300 Wolcott Road (SBL 18.00-1-17.1)

SBL 18.00-1-17.2 Spoth Patrick, Spoth Charlene 9270 Wolcott Road/Clarence Center

SBL 18.00-1-18.1 Hamann Martin, Hamann Sandra 9260 Wolcott Road/Clarence Center

SBL 18.00-1-19.1 Sieber, Mark 9250 Wolcott Road/Clarence Center

SBL 18.00-1-21.1 Thompson Margaret I Life Use, Thompson III et al. Edwin George

9200 Wolcott Road/Clarence Center

SBL 18.00-1-14 Fischer Erich Life Use, Fischer et al. Thomas J

7870 Goodrich/Clarence Center

18.00-1-35 Spoth, Patrick Spoth Charlene

The Town of Clarence Zoning Bylaw deals directly with this category of wind tower in Section 173. The project will require the approval of three variances from the existing Town Code. The proposed wind turbines are each 154' in total height (from base to vertical blade tip) therefore the applicant is requesting that the Zoning Board approve a variance of 94' per tower on the current dimensional restriction to allow for the installation of each wind turbine. Additionally, the Applicant wishes to install two towers on the assigned lot, whereas current Town Code restricts this to a single tower, therefore the Applicant is requesting a variance to allow for the siting of two turbines per lot.

Other details of this project include:

- The wind turbines are approximately 154' tall at the highest point. The vertical distance from ground level to the tip of the blades at its lowest point are 129'.
- The towers, nacelles and blades are only available in a non-reflective, unobtrusive shade of white
 - Tower – RAL 9016
 - Nacelle and Blades – RAL 9003
- Turbine 1 is the nearest of the two turbines at greater than 300' to the closest public way.
- The project's construction should take approximately 3-6 weeks to complete although this may be spread out over a two month period to provide for adequate curing for the foundations.
- The area to be disturbed for construction will be limited to the foundation footprints – approximately 455 sq. ft. each.
- No permanent access roads will be required to transport equipment to the installation site.

- The foundation and tower designs are certified by the manufacturer as sufficient to withstand wind-load requirements for structures as established by the NYS Uniform Fire Prevention and Building Code.
- All electrical wires will be buried underground from the wind turbines to the main electrical loads.
- The towers will have first 12' of climbing pegs removed from the base of the towers to prevent climbing.
- The wind turbine is equipped with an Autofurl overspeed protection device.
- The wind turbine will have a lightning protection system.
- The wind turbines will be interconnected with the local utility grid, following the New York State Standardized Interconnection Requirements (NYSIR).
- The project's anticipated lifetime is 25 years and will be operated and maintained by UnitedWind through this time period.
- There are no federal, state or county permits required for this project's execution at this time.

Attachment A

Request for Use Variance Application Package

SUPPLEMENTAL INFORMATION TO APPLICATION FOR USE VARIANCE

Attachment A – Request for Use Variance Application Package

Attachment B - Site Plan

Attachment C –Drawings of Structural Components (Foundation and Tower)

Attachment D – Line Drawing of electrical components

Attachment E – Wind Turbine Specifications

Attachment F - Statement on Rotor Safety

Attachment G – Tower Access

Attachment H – Bergey Acoustics Summary

Attachment I – Electromagnetic Interference

Attachment J – SEQR Short Form EAF

Attachment K – Small Wind Turbines and Shadow Flicker

Attachment L – Bird Mortality and Small Wind Turbines

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☐ Other

Rec'd. by: _____

Date _____

Action Desired The Applicant proposes the construction of two (2) on-site small wind energy conversion systems to be sited on the same lot SBL No. 18.00-1-17.1, 9300 Wolcott Road. The lot is comprised of 27.89 acres. Each turbine will be 154' at the highest reach of the wind turbine blade. The first turbine will offset electrical usage on-site for the existing barn and agricultural facilities. The second turbine will offset electrical usage for the existing residence located on the adjoining lot of SBL No.18.00-1-35, 9270 Wolcott Road. The property under consideration is zoned Rural Residential and is located in Agricultural District 14 (Clarence-Newstead). The Applicant/owner owns both lots discussed herein.

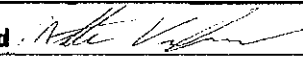
Reason Town Code 173-5 Location Restrictions and General Requirements Part A.1
Town Code 173-4 Dimensional Restrictions Part C

PLEASE PRINT

Name Matt Vanderbrook

Address 317 Route 104

Town/City Ontario **State** NY **Zip** 14519

Signed 

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Filed with Town Clerk on 20
Filed with County Clerk on 20

Directions for Applicants Requesting a Variance

Application process -

The applicant must be the property owner or an authorized representative of the property owner at the time of the request for variance. It is the responsibility of the applicant to submit the following information to the Planning and Zoning Department:

1. A "Request for Action" form.
2. A copy of an official survey stamped by a licensed surveyor or engineer. (Must be no larger than 8.5" x 14")
3. Photographs, drawings, or any other descriptions necessary to describe the requested variance.
4. An "Access Consent" form that allows the ZBA members to inspect your property.
5. Neighbor notification letters from adjacent neighbors indicating they are aware of your request and hearing time.
6. A non-refundable fee of \$50.00 payable to the Town of Clarence for the public notice and hearing.

Applications are due two weeks prior to the meeting date (normally, the last Wednesday of the month). The meetings are held on the second Tuesday of the month at 7:00 p.m. at Town Hall in the Kathleen Hallock Conference Room. The applications will be heard in the order they were received.

Prepare your property for inspection -

1. Identify the property by house number or a sign visible from the road.
2. Stake the appropriate points on your property where the variance is being requested. (ie. corners of proposed building, or the leading edge of sign)

Public notice and hearing -

1. Official notice will be published in the Clarence Bee or Buffalo News **at least** five days before the hearing date.
2. All interested parties will be allowed to speak. Presentations should be complete and concise.
3. The applicant must appear personally or by an authorized representative.
4. The meeting is held at Town Hall in the Kathleen Hallock Conference Room.

The Zoning Board of Appeals is a five-member board comprised of local citizens who may deny, approve, conditionally approve, or table your request. If the above information is not provided before the application deadline, your case will be postponed until the next available meeting. The above notes have been compiled for informational purposes only. If you have any questions, please contact the Planning and Zoning Office at 741-8933.

Purpose of a zoning ordinance and granting variances

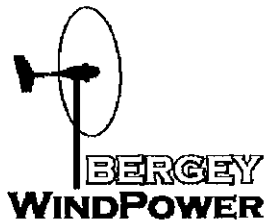
The purpose of a local zoning law is to protect the health, welfare, and safety of the residents in the community. Any change in land use should protect the value of the surrounding neighborhood or provide a more enjoyable or pleasing community. A requested variance will only be granted if the applicant can pass the tests outlined in Town Law Section 267-b that are included in this informational packet.

Attachment B

Site Plan

Attachment C

Drawings of Structural Components
(Foundation and Tower)



2200 INDUSTRIAL BLVD.
NORMAN, OK 73069 USA
T: 405-364-4212
F: 405-364-2078
E-MAIL: kencraig@bergey.com
WEB: www.bergey.com

Wind Turbine Tower Structural & Foundation Analysis

Date: 02 June 2014

Tower Owner: United Wind Inc. Client
Tower Location: Sites requiring basic wind speed \leq 100 mph and
Topographic Category 3 crest height \leq 100 ft
Turbine/Tower Type: Excel-10 or Excel-6 Turbine on SSV-140 ft tower

Design Codes: NYBC-2010, IBC-2012, TIA 222-G, ACI 318-11

Design wind conditions: 100 mph basic
Design ice accumulation: \leq 1.0 inch radial
Design wind with Ice: 40 mph
Design frost depth: \leq 64 inches
Assumed soil strength: 2000 psf allowed bearing load

Analysis Performed by:

Engineer: Kenneth G. Craig

New York P.E. Number: 083114

License Expiration Date: 31 October 2016

Kenneth G. Craig

02 June 2014

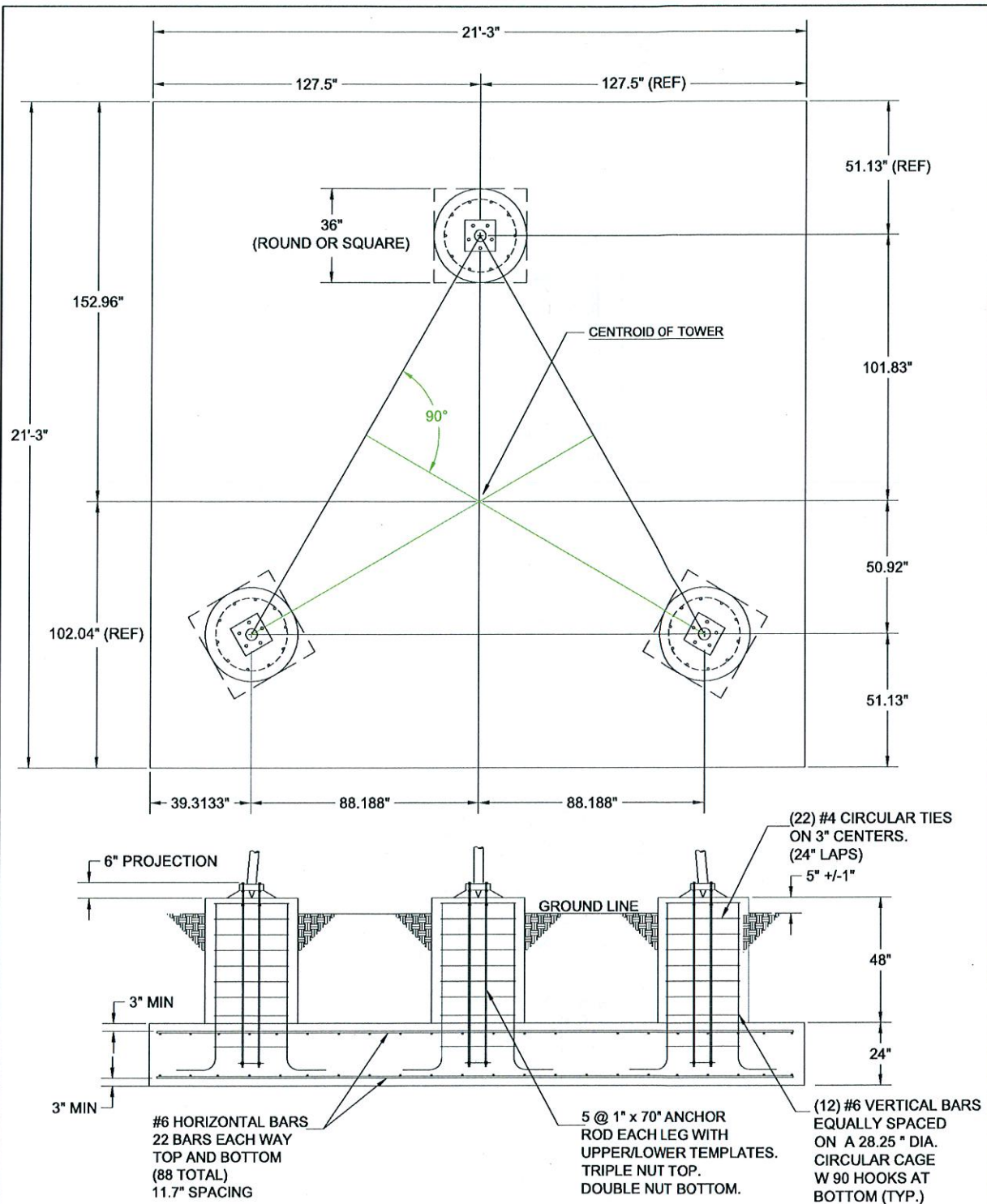
Date



General Notes:

1. The minimum yield strength of tower steel members is as noted below:
 - a. Tower legs are ASTM A618 Grade 3, minimum yield strength 50 ksi.
 - b. Tower flanges are ASTM A572 Grade 50, minimum yield strength 50 ksi.
 - c. All lattice elements are ASTM A36, minimum yield strength 30 ksi.
 - d. Anchor rods are ASTM F1554 Grade 105, minimum yield strength 105 ksi.
2. All structural bolts conform to ASTM A-325 unless otherwise noted.
3. PAL nuts are to be used with all tower and anchor hardware.
4. All high strength bolts are to be tightened to a "snug-tight" condition as defined in the June 23, 2000 AISC "Specification for structural joints using ASTM A325 or A490 bolts." No other specification for minimum torque or bolt tension is required.
5. It is the responsibility of the customer and/or installers to verify the installation is in compliance with all relevant local, state and federal codes.
6. BWC provides tower analysis at minimal cost as a service to our customers. Customers are responsible for hiring all local engineers, inspectors, supervisors and other construction- or code-related personnel and services.

WARNING: It is a violation of New York State law Article 145 for any unauthorized or unsupervised person to alter these documents in any way.



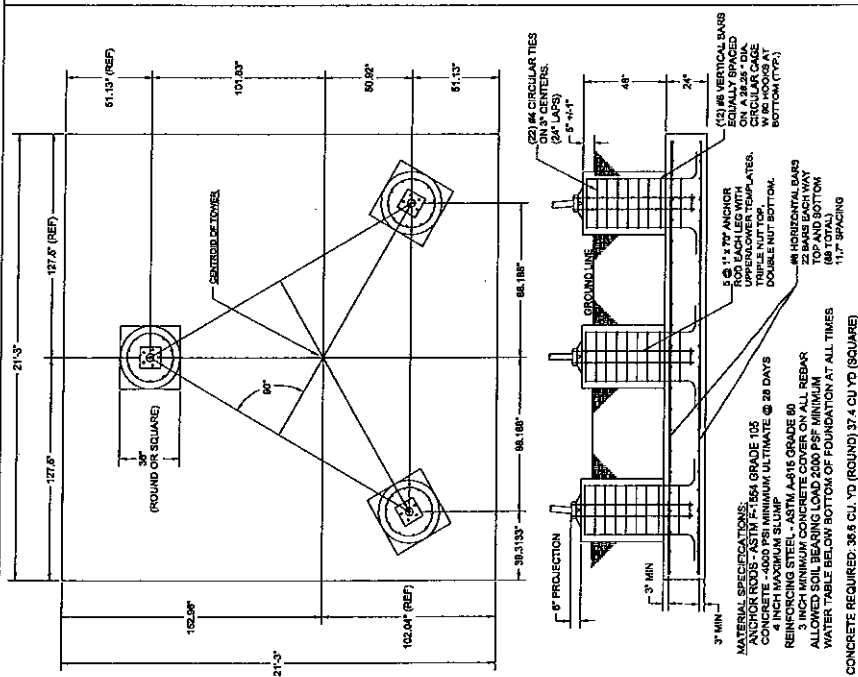
MATERIAL SPECIFICATIONS:

ANCHOR RODS - ASTM F-1554 GRADE 105
 CONCRETE - 4000 PSI MINIMUM ULTIMATE @ 28 DAYS
 4 INCH MAXIMUM SLUMP
 REINFORCING STEEL - ASTM A-615 GRADE 60
 3 INCH MINIMUM CONCRETE COVER ON ALL REBAR
 ALLOWED SOIL BEARING LOAD 2000 PSF MINIMUM
 WATER TABLE BELOW BOTTOM OF FOUNDATION AT ALL TIMES

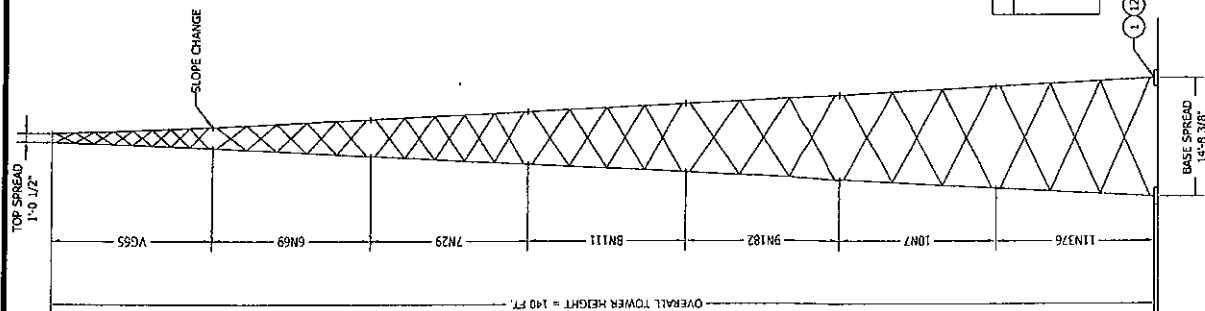
CONCRETE REQUIRED: 36.6 CU. YD (ROUND) 37.4 CU YD (SQUARE)

BERGEY WINDPOWER

TITLE		SSV-140 FOUNDATION MAT-WITH-PIERS
DRAWN K.G.C. 05-14-2013	CLIENT DATA	
CHECKED	STOCK FOUNDATION IBC 100 MPH BASIC WIND SPEED TOPO CATEGORY 3, CREST 100 FT.	
APPROVED	DWG NO.	
SCALE	NONE	PPT3-SSV-140-100 0

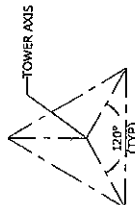


DRAWN K.C.C.	TITLE
08-02-2014	SUMMARY SHEET - STOCK
CHECKED	SSV-140 TOWER SYSTEM
	XL-10 OR XL-5 TURBINE
APPROVED	100 MPH BASIC WIND SPEED
SCALE NONE	DWG NO. 1416-XL-SSV-140



TOWER DESIGN LOADING	
DESIGN WIND LOAD PER ANSI/TIA-222-G USING THE FOLLOWING DESIGN CRITERIA:	
BASIC WIND SPEED (NO ICE): 125 MPH	
BASIC WIND SPEED (ICE): 60 MPH	
DESIGN ICE THICKNESS = 1.25 IN.	
STRUCTURE CLASS: II	
EXPOSURE CATEGORY: C	
TOPOGRAPHIC CATEGORY: 1. EARTHQUAKE SPECTRAL RESPONSE ACCELERATION, $S_s < 1.000$	
THIS TOWER IS DESIGNED TO SUPPORT THE FOLLOWING LOADS:	
ELEVATION (FT)	ANTENNA TYPE
TOP	BERGEY 10KW TURBINE ALLOWABLE THRUST = 2,400 LBS
LINE SIZE (NOM)	
(2) 1" CONDUIT	

STRUCTURE HAS BEEN DESIGNED TO DEFLECT NO MORE THAN 16.8" AT 60 MPH OPERATIONAL WIND CONDITION. DESIGN BASED ON STATIC LOADING ONLY. DYNAMIC AND HARMONIC CONDITIONS HAVE NOT BEEN CONSIDERED AND ARE THE RESPONSIBILITY OF OTHERS.



TOWER CONFIGURATION

MAXIMUM FACTORED REACTIONS	
COMPRESSION =	151.2 KIPS
TENSION =	132.1 KIPS
TOTAL SHEAR =	25.4 KIPS
O.M. =	1885.4 FT-KIPS

ANCHOR MATERIAL			ANCHOR BOLT STR ASSY 15-1X48			DWG. NO.
ITEM	QTY	PART NO.	DESCRIPTION			DWG. NO.
1	1	15F1470				15F1470
607018LAB - TOWER ACCESSORIES						
ITEM	QTY	PART NO.	DESCRIPTION			DWG. NO.
2	1	11N376	SECTION ASSY 11N 20 4EH BASE			11N376
3	1	10W7	SECTION ASSY 10W 20 3.5EH			A780395
4	1	9N182	SECTION ASSY 9N 20 3.5EH			A830385
5	1	8N111	SECTION ASSY 8N 20 3EH			A800209
6	1	7N29	SECTION ASSY 7N 20 2.5EH			A780168
7	1	6G69	SECTION ASSY 6N 20 2.5STD			A790310
8	1	VN65	SECTION ASSY VG16 20 2.5STD			A810205
9	1	ACVHS	SIGN ANTI-CLIMB WARNING ASSY			N/A
10	1	A790135	DRAWING BOLT ASSY			A790135
11	1	B651264	STEERBOLT DETAIL			B651264
12	3	B080GEX	KIT BASE GRD SSD TAB GALV.			B070997
13	1	710004	CARTON, NO. 80			N/A
607018SPD - SAFETY DEVICE						
ITEM	QTY	PART NO.	DESCRIPTION			DWG. NO.
14	1	TT1605950	SAFETY DEVICE TUP TUG SSD 340"			N/A
15	1	TT-WG-500	WIRE GRAB FALL ARRESTOR			N/A

GENERAL NOTES

1. ROHN PRODUCTS, LLC TOWER DESIGNS CONFORM TO ANSI/TIA/EIA-222-G UNLESS OTHERWISE SPECIFIED. UNLESS OTHERWISE SPECIFIED.
2. UNLESS AND LINES LISTED IN TOWER DESIGN LOADING TABLE ARE PROVIDED BY OTHERS.
3. THE DESIGN LOADING CRITERIA INDICATED HAS BEEN PROVIDED TO ROHN. THE DESIGN LOADING CRITERIA HAS BEEN ASSUMED TO BE BASED ON SITE-SPECIFIC DATA IN ACCORDANCE WITH ANSI/TIA/EIA-222-G AND MUST BE VERIFIED BY OTHERS PRIOR TO INSTALLATION.
4. SEE INDIVIDUAL SECTION ASSEMBLY DRAWINGS FOR PART NUMBERS AND SECTION ASSEMBLY DETAILS.
5. FUTURE PARTS ARE PROVIDED ON ONE LEG ONLY FOR SECTIONS VG THROUGH 11N SECTIONS.
6. RIBBON CUTS ARE DIVISIONS OF THE DRAWINGS SHOWN IN THE BILL OF MATERIALS.
7. ALL LOCKING DEVICES TO BE PROVIDED BY THE TOWER MANUFACTURER.
8. THE LEG PART NUMBER IS STAMPED AT THE BOTTOM OF EACH LEG OF EACH SECTION.
9. DESIGN ASSUMES LEVEL GRADE AT TOWER SITE.
10. WORK SHALL BE IN ACCORDANCE WITH ANSI/TIA/EIA-222-G, "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES".
11. TOLERANCE ON TOWER STEEL HEIGHT IS EQUAL TO PLUS 1% OR MINUS 1/2%.
12. PURCHASER SHALL VERIFY THE INSTALLATION IS IN CONFORMANCE WITH LOCAL, STATE, AND FEDERAL REQUIREMENTS FOR OBSTRUCTION MARKING AND LIGHTING.
13. TOWER DESIGN ASSUMES COMPETENT AND QUALIFIED PERSONNEL WILL ERECT THE TOWER. DESIGN ASSUMES COMPETENT AND QUALIFIED PERSONNEL THAT, AS A MINIMUM, MAINTENANCE AND INSPECTION WILL BE PERFORMED OVER THE LIFE OF THE STRUCTURE IN ACCORDANCE WITH ANSI/TIA/EIA-222-G.
14. TOWER ORIENTATION TO BE DETERMINED BY OTHERS.
15. STEP BOLTS WITH SAFETY DEVICE, LESS HARNESS, ARE PROVIDED FOR CLIMBING THE ENTIRE TOWER HEIGHT.
16. THE DESIGN OF THE REFERENCED STRUCTURE HAS BEEN BASED ON EQUIVALENT STATIC LOADINGS CONDITIONS PROVIDED BY THE TURBINE MANUFACTURER. THE TURBINE INTENDED TO BE CONSIDERED AS A MINIMUM, FATIGUE, HARMONICS AND DYNAMIC LOADING. ROHN DOES NOT PROVIDE A MINIMUM, FATIGUE, HARMONICS AND DYNAMIC LOADING. HARMONICS OR DYNAMIC LOADING RELATED TO THE TURBINE FOUNDATIONS SHALL BE DESIGNED TO SUPPORT THE REACTIONS SHOWN FOR THE CONDITIONS EXISTING AT THE SITE.
17. WITH TURBINE INTERFACE TO TOWER TO BE PROVIDED BY OTHERS.
18. NUMBERS SHOWN IN BALLOONS DENOTE ITEM NUMBERS IN BILL OF MATERIAL.



PO BOX 5999
PEORIA, IL 61601-5999
TOLL FREE 800-727-ROHM

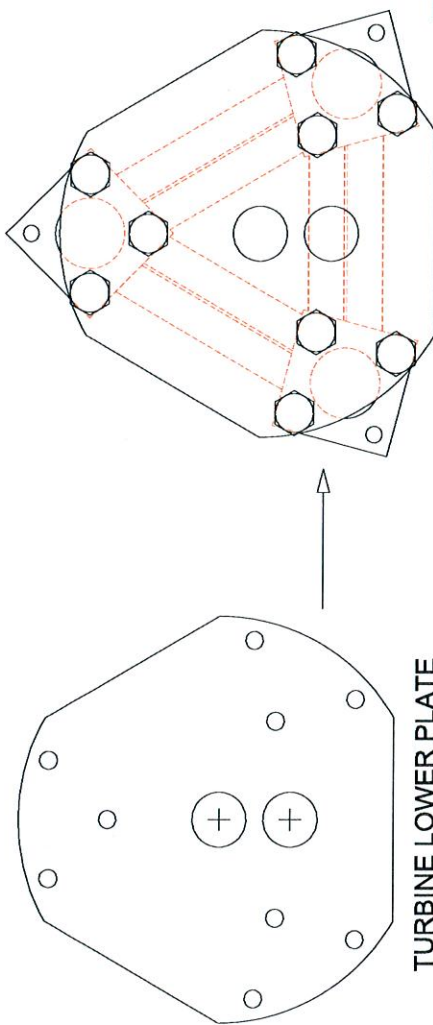
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NOKIA'S WRITTEN PERMISSION

WINDPOWER CO., INC.
TOWER PROFILE
TSSV TOWER
GENERIC

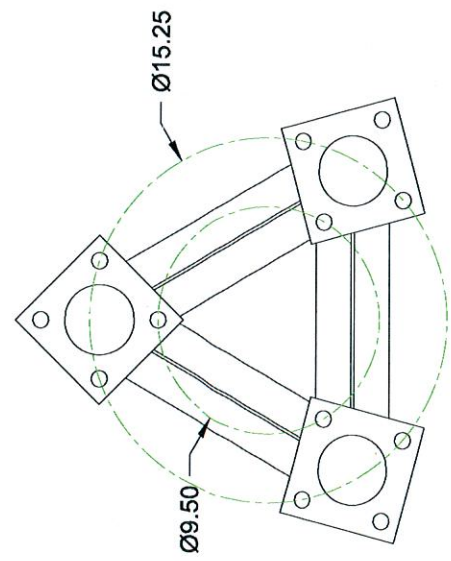
OWN;	CHCD:	DATE:
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ENGINEER:

DRAWING NO:	607018-01-A1	REV:	0
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TURBINE BOLTED TO TOWER
WITH (9) ASTM A-325 BOLTS
SIZE 5/8"-11 x 3-1/4" LONG



TOWER TOP GEOMETRY

Excel-10 Turbine Attachment Bolt Stress				
Turbine thrust load =	2,400	lb	acting	2
Turbine max yaw-induced moment =	6,000	ft-lb		
Turbine max overturning moment =	10,800	ft-lb	(wind load + yaw-induced moment)	
For (6) A325 bolts	0.625	inch diam.	acting on	15.25
and (3) A325 bolts	0.625	inch diam.	acting on	9.5
Moment of inertia about tower axis = I =				127.86
				in ⁴
Max tensile stress in bolts = $M \times c / I =$				8,046
				psi
F.S. (tensile) = allowed / applied =				5.47
				(Allowed = 44 ksi)
Max shear stress in bolts (assume 2 bolts engaged) = $F / A =$				3,911
				psi
F.S. (shear) = allowed / applied =				5.37
				(Allowed = 21 ksi)

**TOLERANCES
UNLESS OTHERWISE
SPECIFIED**

.X = ± .060
.XX = ± .030
.XXX = ± .010

BERGEY WINDPOWER

**ATTACHMENT OF
EXCEL-10 TURBINE
TO SSV TOWERS**

DRAWN
K. G. C.
DS-08-2013

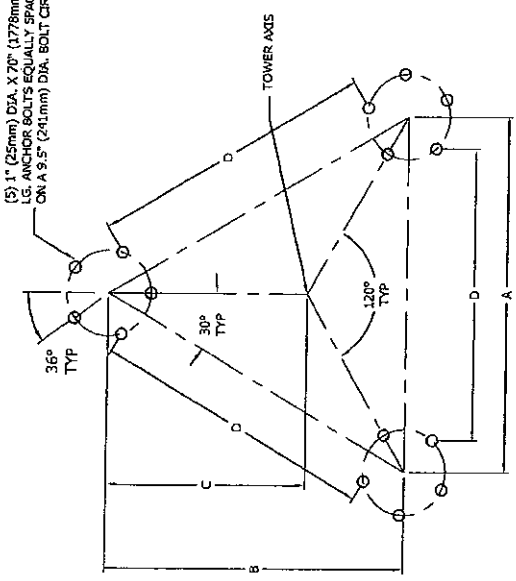
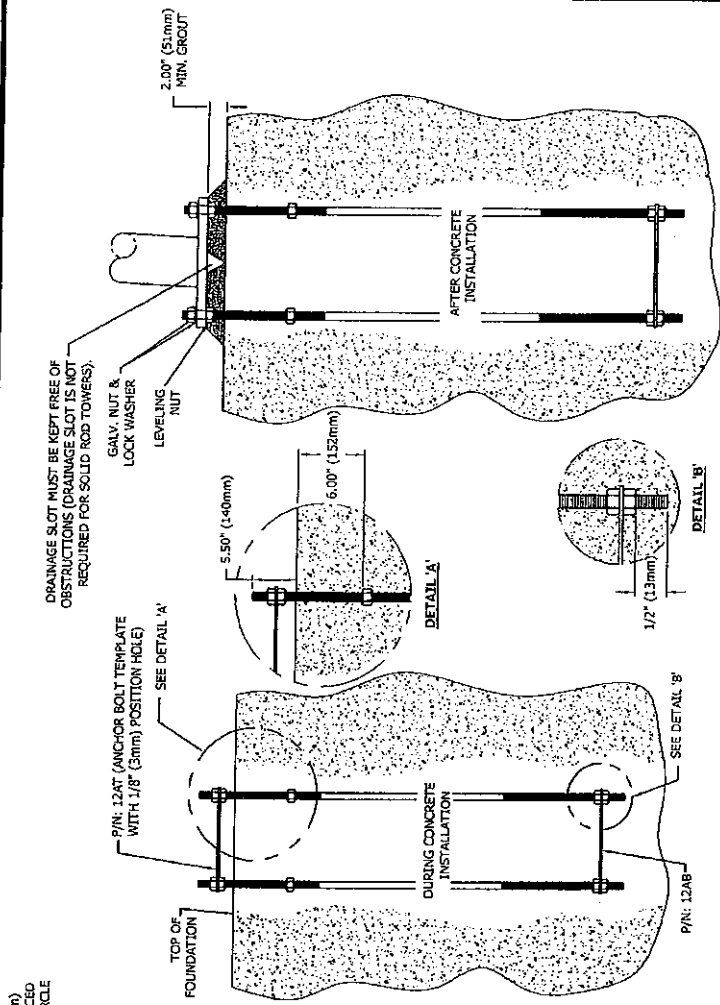
CHECKED

APPROVED

SCALE
NONE

DWG NO.

FILE NO.	Standard-SSV
REV.	DESCRIPTION
DRAWN	CHK
APP	



PLAN VIEW IN' & S			
A	B	C	D
14'-8 3/8" (4.481M)	12'-8 3/4" (3.880M)	8'-5 7/8" (2.587M)	14'-1 5/16" (4.301M)

ANCHOR BOLT INSTALLATION TOLERANCES

- FACE SPREAD DIMENSION CENTER-TO-CENTER OF ANCHOR BOLT CIRCLES - PLUS OR MINUS 1/16" (2mm) OR 1/16" (2mm) PER 20 FT. (6m) OF FACE SPREAD.
- MAXIMUM DIFFERENCE BETWEEN ANY TWO FOUNDATION ELEVATIONS - 1/2" (13mm).
- CONCRETE DIMENSIONS - PLUS OR MINUS 1" (25mm).
- DEPTH OF FOUNDATION - PLUS 3" (76mm) OR MINUS 0".
- DRILLED FOUNDATIONS OUT OF PLUMB - 1.0 DEGREE.
- WELDING OF EMBEDMENTS - PER A.C.I. 308.
- PROJECTED EMBEDMENTS OUT OF PLUMB - 1/2 DEGREE.
- MAXIMUM DISTANCE FROM CENTERLINE OF ANCHOR BOLTS TO CENTERLINE OF FOUNDATION - 1/4 OF PIER DIAMETER UP TO A MAXIMUM OF 2" (51mm) (2mm).
- ANCHOR BOLT SPACING - 1/4" (6mm).
- ANCHOR BOLT CIRCLE ORIENTATION - 1/4 DEGREE.
- ANCHOR BOLT CIRCLE DIAMETER - PLUS OR MINUS 1/16" (2mm).

- WARNING!!! ENSURE DIMENSION 'D' IS CORRECT ON ALL FACES PRIOR TO PLACING CONCRETE.
- AFTER ANCHOR BOLTS ARE INSTALLED AND CONCRETE HAS TAKEN ITS INITIAL SET, ANCHOR BOLTS MUST NOT BE MOVED, BENT OR REALIGNED IN ANY MANNER. A NUT LOCKING DEVICE MUST BE INSTALLED ON ALL ANCHOR BOLTS.

NOTES

- ALL ANCHOR BOLTS MUST MEET OR EXCEED REQUIREMENTS OF A.S.T.M. F1554-52, S5 GRADE 105.
- GROUT TO BE 5000 PSI MIN. ULTIMATE STRENGTH 7 DAY.
- NON-SHRINKING AND NON-METALLIC.
- SPECIAL CARE MUST BE TAKEN WHEN LIFTING ANCHOR BOLT CLUSTER, IN ORDER TO PREVENT ANCHOR BOLT TEMPLATE DISTORTION.
- ANCHOR BOLT ASSEMBLY MUST BE ADEQUATELY SUPPORTED DURING CONCRETE INSTALLATION.
- IT IS THE RESPONSIBILITY OF THE FOUNDATION CONTRACTOR TO VERIFY THAT THE CORRECT ANCHOR BOLT TEMPLATE AND FOUNDATION SHOWN ON RESPECTIVE SITE DRAWINGS ARE BEING USED.
- IT IS THE RESPONSIBILITY OF THE FOUNDATION DESIGN ENGINEER TO INSURE THAT THE ANCHORAGES PROVIDED ARE COMPATIBLE WITH THE PROPOSED FOUNDATION DESIGNS AND THAT THE CAPACITIES OF THE ANCHORAGES ARE NOT LIMITED BY THE STRENGTH OF THE FOUNDATIONS.



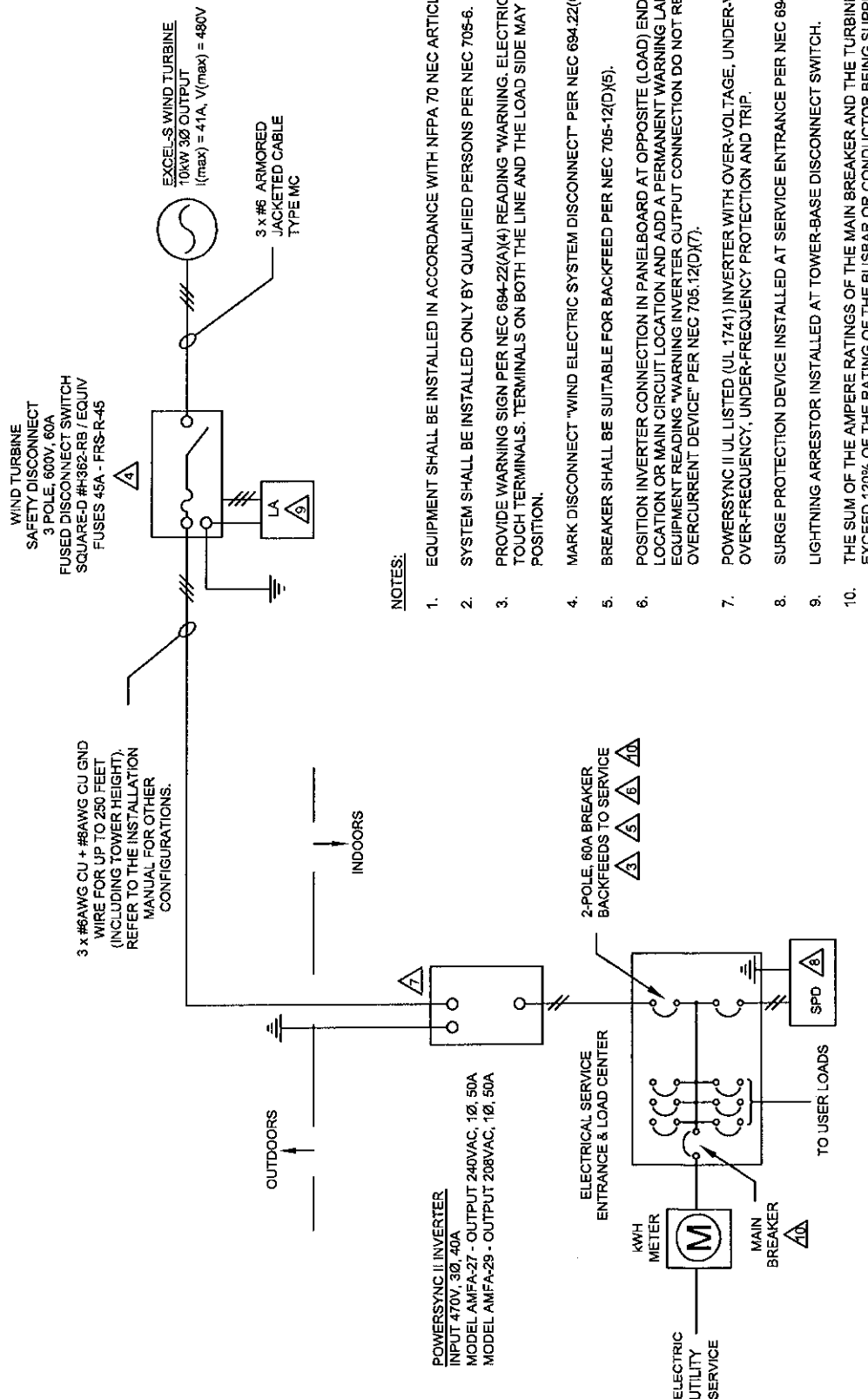
ROHN PRODUCTS LLC
PO BOX 1999
PEORIA, IL 61611-5999
TOLL FREE 800-772-ROHN
THIS DRAWING IS THE PROPERTY OF ROHN PRODUCTS LLC. IT IS TO BE USED ONLY FOR THE PROJECT AND SITE SPECIFICALLY IDENTIFIED ON THE DRAWING. IT IS NOT TO BE REPRODUCED OR COPIED IN WHOLE OR IN PART WITHOUT OUR WRITTEN CONSENT.

ANCHOR BOLT LAYOUT
1" 7/8" DIA. BOLTS (P/N: 15H1470)

DRAWN	CHK'D	DATE
ABS	M.F	Apr/05/2010
ENG'D	DWG	
DRAWING NO:	15H1470	REV: 0

Attachment D

Line Drawing of Electrical Components

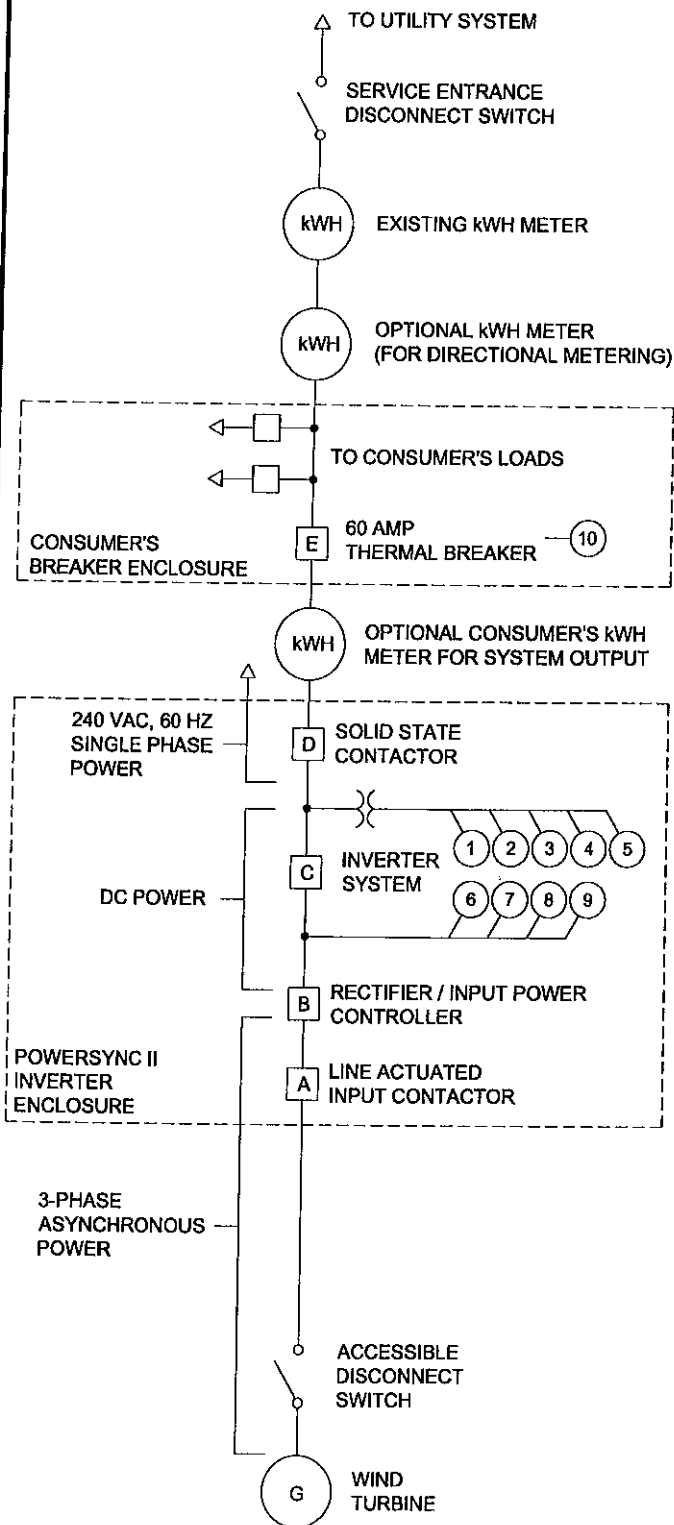


- NOTES:**
- EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH NFPA 70 NEC ARTICLE 694.
 - SYSTEM SHALL BE INSTALLED ONLY BY QUALIFIED PERSONS PER NEC 705-6.
 - PROVIDE WARNING SIGN PER NEC 694-22(A)(4) READING "WARNING. ELECTRIC SHOCK HAZARD. DO NOT TOUCH TERMINALS. TERMINALS ON BOTH THE LINE AND THE LOAD SIDE MAY BE ENERGIZED IN THE OPEN POSITION."
 - MARK DISCONNECT "WIND ELECTRIC SYSTEM DISCONNECT" PER NEC 694.22(C)(2).
 - BREAKER SHALL BE SUITABLE FOR BACKFEED PER NEC 705-12(D)(5).
 - POSITION INVERTER CONNECTION IN PANELBOARD AT OPPOSITE (LOAD) END FROM THE INPUT FEEDER LOCATION OR MAIN CIRCUIT LOCATION AND ADD A PERMANENT WARNING LABEL TO THE DISTRIBUTION EQUIPMENT READING "WARNING INVERTER OUTPUT CONNECTION DO NOT RELOCATE THIS OVERCURRENT DEVICE" PER NEC 705.12(D)(7).
 - POWERSYNC II UL LISTED (UL 1741) INVERTER WITH OVER-VOLTAGE, UNDER-VOLTAGE, OVER-FREQUENCY, UNDER-FREQUENCY PROTECTION AND TRIP.
 - SURGE PROTECTION DEVICE INSTALLED AT SERVICE ENTRANCE PER NEC 694.7(D).
 - LIGHTNING ARRESTOR INSTALLED AT TOWER-BASE DISCONNECT SWITCH.
 - THE SUM OF THE AMPERE RATINGS OF THE MAIN BREAKER AND THE TURBINE BREAKER SHALL NOT EXCEED 120% OF THE RATING OF THE BUSBAR OR CONDUCTOR BEING SUPPLIED PER NEC 705.12(D)(2).

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Attachment E

Wind Turbine Specifications



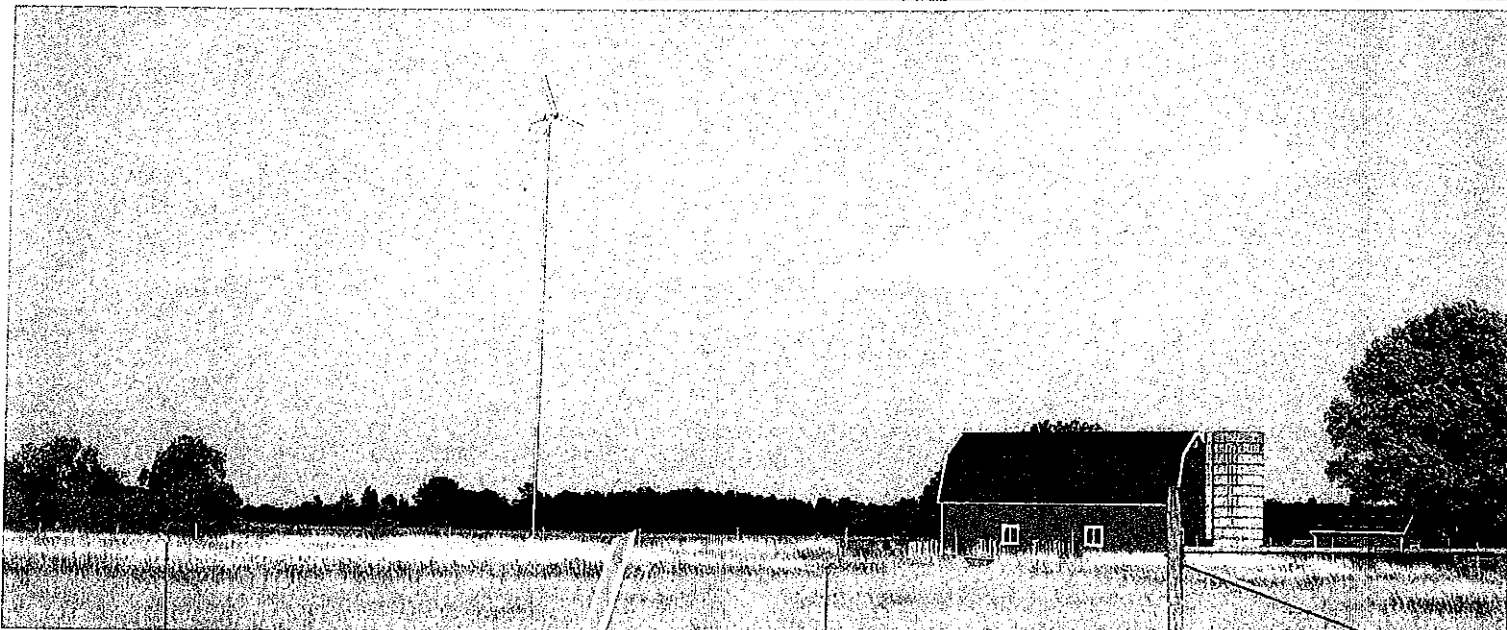
DEVICE NUMBER	FUNCTION	ACTIVATES DEVICES
1	AC LINE LOSS DETECTION	A,B,C,D
2	SYNCHRONIZATION CONTROL	C
3	UNDER / OVER FREQUENCY DETECTION	B,C,D
4	AC DISTORTION DETECTION	B,C,D
5	AC UNDERVOLTAGE DETECTION	B,C,D
6	OVERCURRENT DETECTION	B,C,D
7	INPUT OVERVOLTAGE DETECTION	B,C
8	POWER LIMIT CONTROL	B
9	GROUND FAULT DETECTION	B,C,D
10	AC OVERCURRENT DETECTION	E

SINGLE-LINE DIAGRAM OF BWC EXCEL-S ELECTRICAL SYSTEM

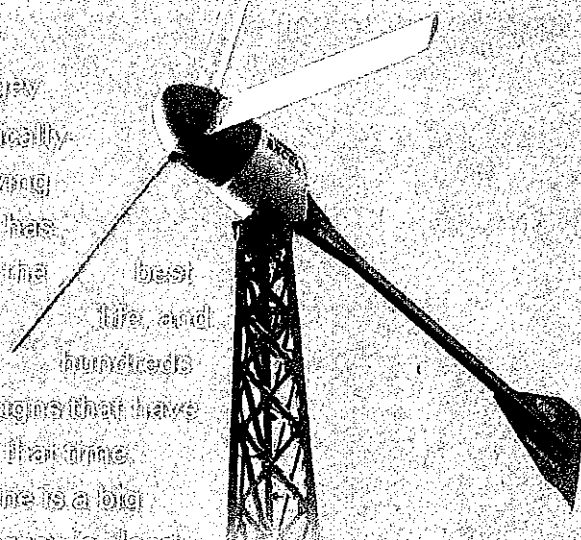
BERGEY EXCEL 10

The wisest way to cut your energy costs is to go green.

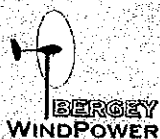
The Bergy Excel 10 is ideal for homes, farms, and small businesses. Its extra large rotor and low cut-in wind speed give it exceptional performance, out-producing all other turbines in its class. More energy means greater savings and a quicker payback.



Proven Choice
30 years ago, Bergy pioneered the radically simple "three moving parts design" that has proven to provide the best reliability, service life, and value of all of the hundreds of competitive designs that have come and gone in that time. A small wind turbine is a big investment and Bergy is clearly the wise choice.



Advanced Technology



2240 Industrial Blvd. • Norman, OK 73069 • 405/664-4212 • www.bergy.com

BERGEY EXCEL 10

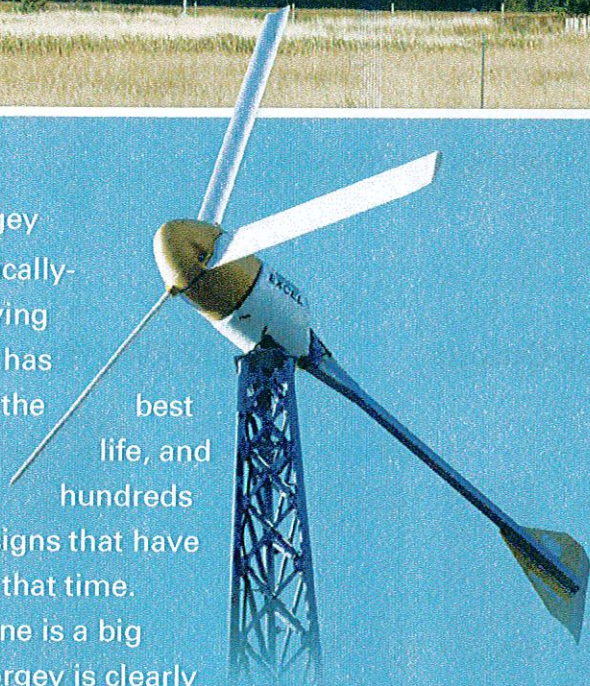
The wise choice for Performance, Reliability, and Ruggedness

The Bergey Excel 10 is ideal for homes, farms, and small businesses. Its extra large rotor and low cut-in wind speed give it exceptional performance, out producing all other turbines in its class. More energy means greater savings and a quicker payback.



The Wise Choice

30 years ago, Bergey pioneered the radically-simple "three moving parts design" that has proven to provide the reliability, service value of all of the best life, and hundreds of competitive designs that have come and gone in that time. A small wind turbine is a big investment and Bergey is clearly the wise choice.



Advanced Technology:

- BW-7 Proprietary Low Noise Airfoil
- Powerflex Super High-Strength Blades
- Neo-10 Direct-Drive Permanent Magnet Alternator
- AutoFurl Storm Protection
- 12kW Powersync II Inverter
- Remote Monitoring (optional)



2200 Industrial Blvd. • Norman, OK 73069 • 405.364.4212 • www.bergey.com



Attachment F
Statement on Rotor Safety

Attachment G
Tower Access



2200 INDUSTRIAL BLVD.
NORMAN, OK 73069 USA
T: 405-364-4212
F: 405-364-2078
E-MAIL: kencraig@bergey.com
WEB: www.bergey.com

24 August 2006

Ref: Confirmation of Rotor Safety

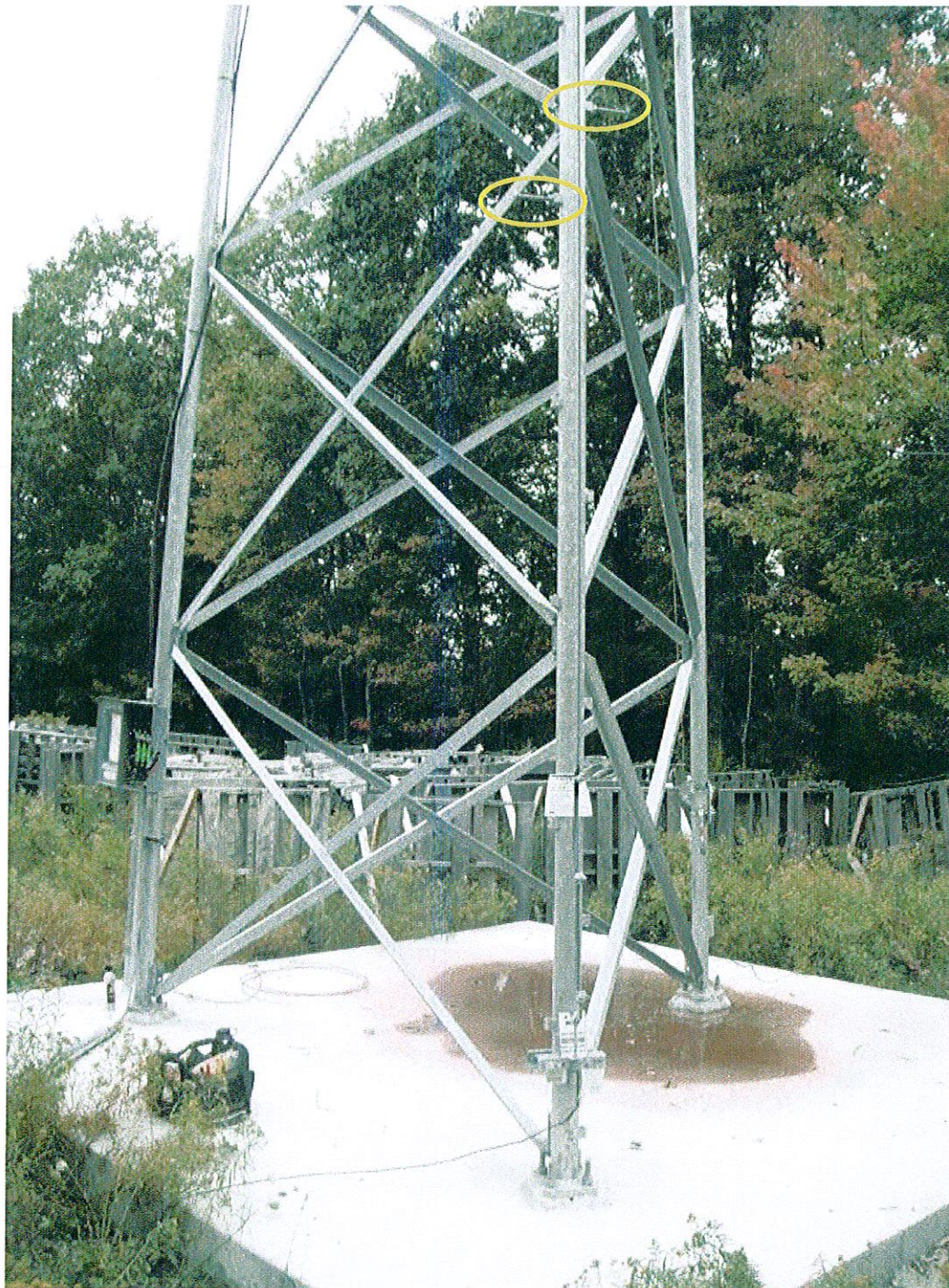
The Bergey Windpower Company Excel wind turbine is equipped with both automatic and manual systems to limit rotor speed below material design limits. The passive AutoFurl system allows the turbine rotor/powerhead system to turn out of the wind, to an 80 degree angle, when wind speed increases above approximately 40 mph. This "furling" process is affected by gust behavior of the wind, so furling speed varies. But the rotor never reaches speeds that cause even 40% of the design breaking stress.

The manual braking system utilizes a cable and tower base-mounted winch to furl the rotor/powerhead to the full 80 degree angle. The system remains in the furled condition until the winch is manually released and cable tension is removed.

The rotor speed controls were designed using accepted engineering practice, and they have performed properly on all Bergey Excel turbines sold since 1983.

Bergey Windpower sells and manufactures towers that are designed to safely support the Excel turbine in all environmental conditions. The towers provide strength, blade clearance and stability that are more than adequate by any standard of good engineering practice. Tower strength and stability is acceptable for all rotor systems that have been used with Excel turbines since their introduction in 1983.

Image of lattice tower with climbing pegs removed. Yellow circle shows pegs.



Attachment H

Bergey Acoustics Summary

SWCC Summary Report

Manufacturer: **Bergey Windpower Company**
Wind Turbine: **Excel 10 (240 VAC, 1-phase, 60 Hz)**
Certification Number: **SWCC-10-12**

The above-identified Small Wind Turbine is certified by the Small Wind Certification Council to be in conformance with the AWEA *Small Wind Turbine Performance and Safety Standard* (AWEA Standard 9.1 – 2009).

For the SWCC Certificate visit: www.smallwindcertification.org



CERTIFIED
SMALL WIND TURBINE
SWCC-10-12

1. Introduction

This report summarizes the results of testing and certification of the Bergey Excel 10 in accordance with AWEA Standard 9.1-2009. The Excel 10 is a 3-blade, upwind, horizontal axis wind turbine with a swept area of 38.5 m². The tested configuration utilized a Powersync II inverter and a Bergey 30 m (100 ft) guyed-lattice tower. Field tests were conducted at the USDA/ARS facility in Bushland, Texas from June 24, 2010 to March 18, 2011.

2. Turbine Ratings

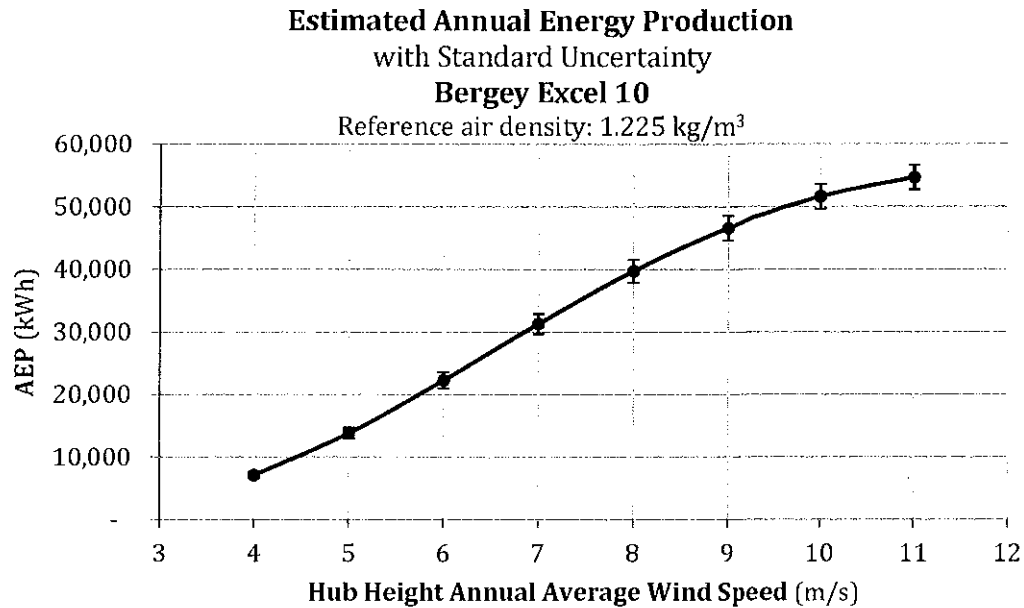
AWEA Rated Annual Energy @ 5 m/s	13,800	kWh
AWEA Rated Sound Level	42.9	dB(A)
AWEA Rated Power @ 11 m/s	8.9	kW

3. Tabulated Annual Energy Production (AEP)

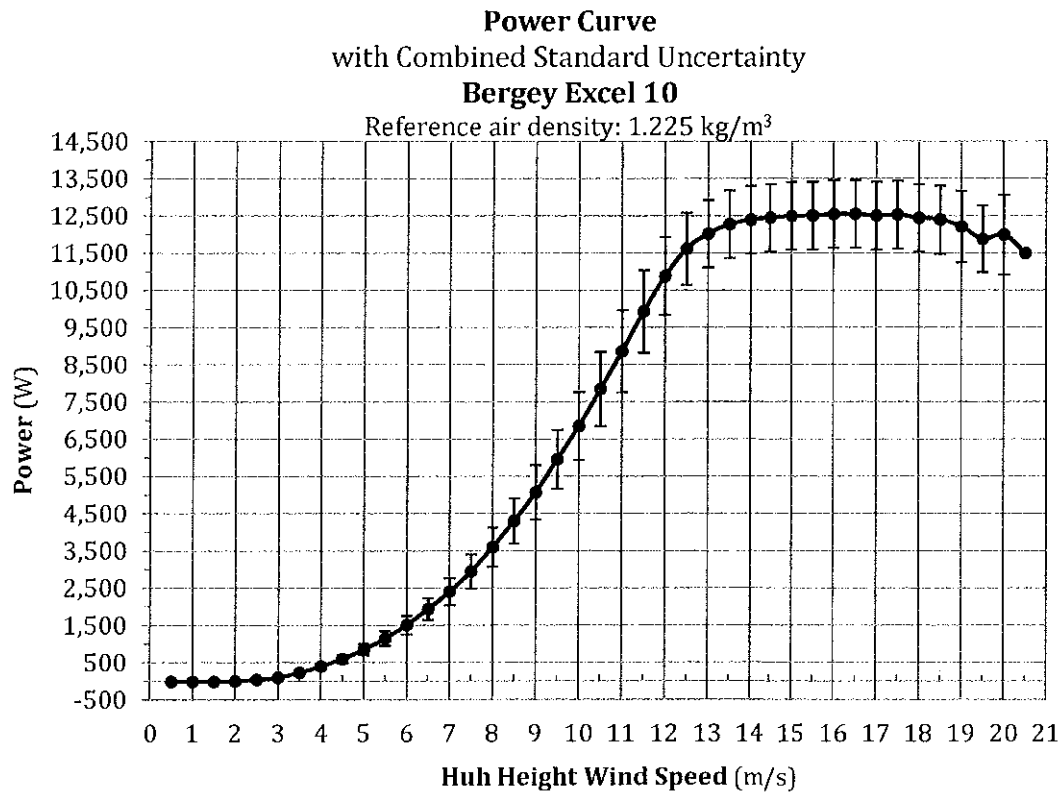
Corrected to a sea level air density of 1.225 kg/m³

Hub Height Annual Average Wind Speed (m/s)	AEP Measured (kWh)	Standard Uncertainty in AEP (kWh)	Standard Uncertainty in AEP (%)	AEP Extrapolated (kWh)
4	7,135	503	7.05	7,135
5	13,842	884	6.39	13,842
6	22,300	1,281	5.74	22,300
7	31,342	1,604	5.12	31,342
8	39,755	1,824	4.59	39,755
9	46,652	1,944	4.17	46,652
10	51,626	1,982	3.84	51,626
11	54,685	1,961	3.59	54,685

4. Annual Energy Production Curve



5. Power Curve



6. Tabulated Power Curve

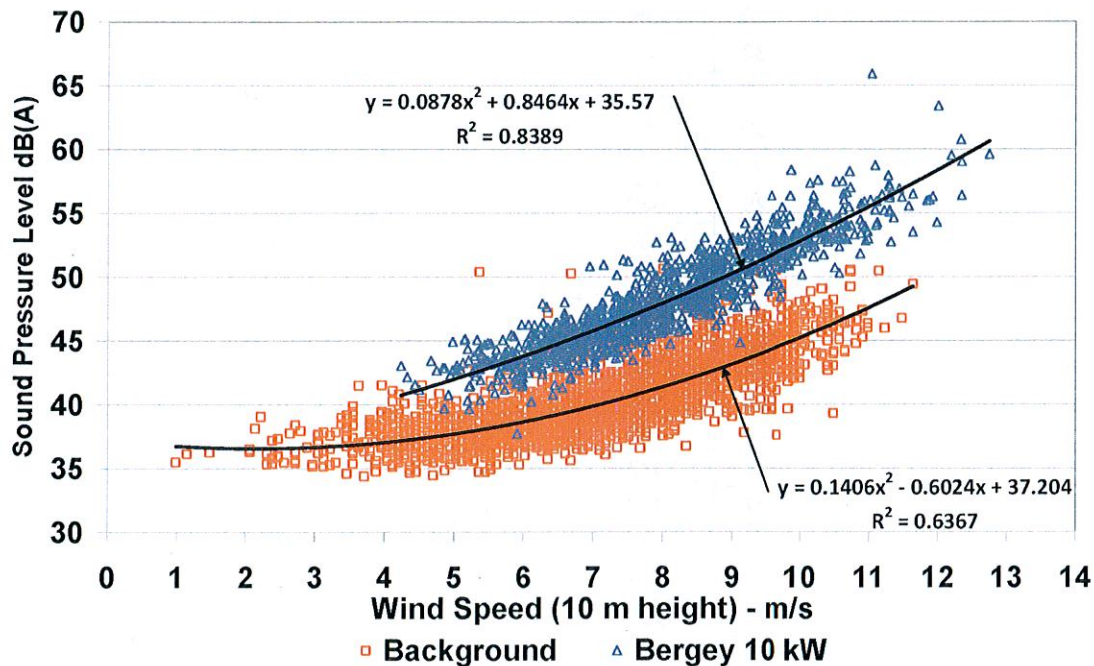
Corrected to a sea level air density of 1.225 kg/m ³					Category A	Category B	Combined
Bin No.	Hub Height Wind Speed	Power Output	Cp	1-minute samples	Standard Uncertainty, Si	Standard Uncertainty, Ui	Standard Uncertainty, Ci
	m/s	Watts			Watts	Watts	Watts
1	0.5	-12		158			
2	1.0	-12		224	0.1	0.9	0.9
3	1.5	-11		309	0.3	0.9	1.0
4	2.0	0		391	0.9	2.9	3.0
5	2.5	39	0.11	375	2.1	10.9	11.1
6	3.0	102	0.16	661	3.0	20.2	20.4
7	3.5	229	0.23	818	3.4	43.8	43.9
8	4.0	399	0.26	1060	3.2	65.4	65.4
9	4.5	596	0.28	1213	3.0	84.5	84.6
10	5.0	848	0.29	1235	3.7	116.9	117.0
11	5.5	1,151	0.29	1279	4.7	152.6	152.6
12	6.0	1,510	0.30	1250	5.4	195.2	195.3
13	6.5	1,938	0.30	1401	6.0	248.5	248.6
14	7.0	2,403	0.30	1355	7.1	293.3	293.4
15	7.5	2,949	0.30	1014	9.9	362.8	362.9
16	8.0	3,602	0.30	885	12.7	452.4	452.6
17	8.5	4,306	0.30	687	16.8	523.1	523.3
18	9.0	5,071	0.30	736	18.0	604.1	604.4
19	9.5	5,960	0.29	668	19.7	725.9	726.1
20	10.0	6,856	0.29	707	21.4	790.8	791.0
21	10.5	7,849	0.29	650	26.2	912.1	912.5
22	11.0	8,863	0.28	599	28.0	994.0	994.4
23	11.5	9,928	0.28	635	24.3	1098.6	1098.9
24	12.0	10,885	0.27	606	24.8	1105.8	1106.1
25	12.5	11,619	0.25	504	21.7	1044.8	1045.0
26	13.0	12,019	0.23	432	15.0	968.6	968.7
27	13.5	12,276	0.21	337	13.3	906.1	906.2
28	14.0	12,395	0.19	333	7.4	906.0	906.1
29	14.5	12,449	0.17	292	7.2	904.5	904.6
30	15.0	12,495	0.16	279	3.3	907.5	907.5
31	15.5	12,508	0.14	231	10.3	907.4	907.4
32	16.0	12,546	0.13	187	5.4	911.0	911.0
33	16.5	12,555	0.12	165	8.5	910.7	910.8
34	17.0	12,503	0.11	125	24.4	908.8	909.1
35	17.5	12,528	0.10	138	17.8	909.2	909.4
36	18.0	12,442	0.09	98	36.2	908.2	908.9
37	18.5	12,396	0.08	94	36.8	901.0	901.7
38	19.0	12,208	0.08	57	65.2	916.2	918.5
39	19.5	11,878	0.07	39	83.4	960.0	963.6
40	20.0	11,989	0.06	18	130.0	882.0	891.5
41	20.5	11,495	0.06	15	124.6	1066.4	1073.7

7. Tabulated Acoustic Data

Wind Speed @ 10m Height m/s	Background Sound Pressure Level (SPL) dB(A)	Corrected Bergey Excel SPL dB(A)	* indicates delta dB between 3 & 6 dB	Bergey Excel SPL Std. Dev. dB	Corrected Sound Power dB(A)
6	38.53	42.38	*	1.37	80.57
7	39.85	44.23	*	1.52	82.42
8	41.36	46.71		1.91	84.90
9	43.32	49.25		1.95	87.44
10	44.91	51.99		1.81	90.18

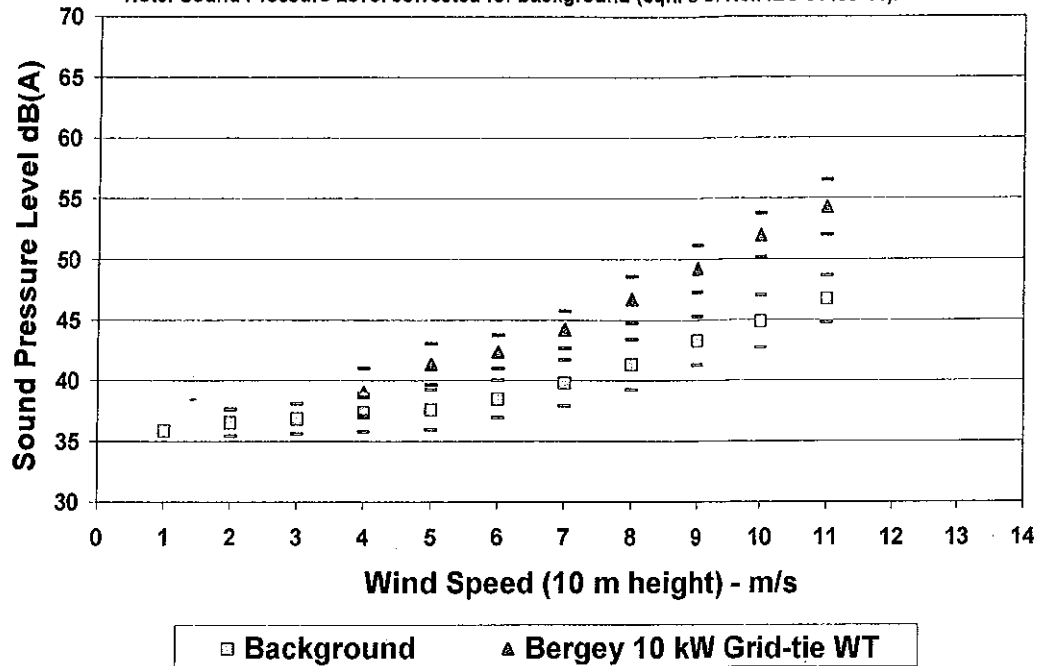
8. Graphical Acoustic Data

Scatter Plot of Bergey 10 kW Acoustical Data (HH=30.5m, Bushland, TX)
Aug. 15, 2011 (Background), Sep. 12 & Oct. 3 of 2011 (Bergey 10 kW)



**Acoustical Data Collected on Bergey 10 kW Grid-tie WT, 30.5 m tower
USDA-ARS Lab near Bushland, TX (Aug/Sep/Oct 2011)**

Note: Sound Pressure Level corrected for background (eqn. 8 of Ref. IEC 61400-11).



9. Duration Testing

The Bergey Excel 10 successfully completed a Duration Test for an IEC Class II Small Wind Turbine.

10. Mechanical Strength Analysis

The mechanical strength analysis was found to be in conformance with IEC 61400-2 as modified by AWEA Standard 9.1 – 2009 for an IEC Class II Small Wind Turbine.

11. Safety and Function testing

Safety and Function testing was found to be in conformance with sections 4.3 and 4.4 of AWEA Standard 9.1 – 2009.

12. Manufacturer Tower Design Requirements

BASIC TOWER REQUIREMENTS for the BWC EXCEL WIND TURBINE

Customer supplied towers for the BWC EXCEL should meet the following requirements:

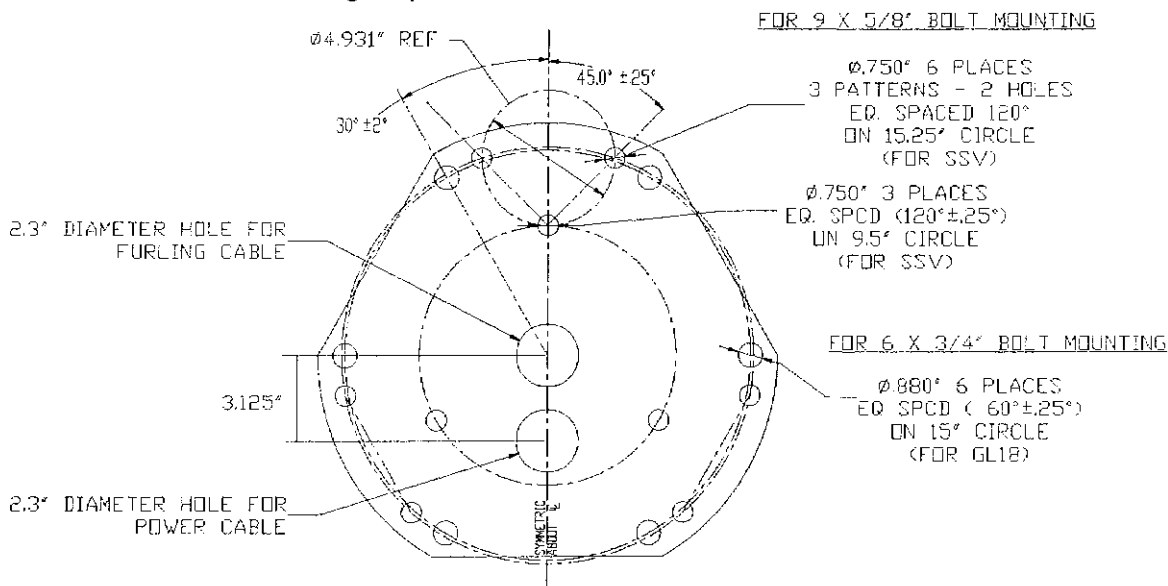
Tower Height:	60 ft (18 m) minimum, 80 ft (24 m) or higher recommended
Design Wind Speed:	120 mph (54 m/s)
Turbine Weight:	1200 lb (545 kg)
Turbine Thrust Load:	2400 lb (1090 kg) @ any wind \geq 40 mph (18 m/s)
Blade Clearance:	The top 12 ft (3.5 m) of the tower must not extend beyond an 18 inch (0.46 m) radius from the tower centerline.
Tower Plumb Tolerance:	Up to 0.25° tolerance from plumb allowed.
Tower Stiffness:	Tilt at the top of the tower should be no more than 2.0° for consistent furling. Deflection of monopole towers at 50 mph should be no more than 1.0% of tower height; at 120 mph no more than 2.5% of tower height. (For a 120 ft tower this would be 14.4 in and 36.0 in, respectively.) Overly flexible towers can cause vibration and/or fatigue problems. A civil engineer should approve the tower.

Blade Frequency:

First Flap Frequency for 10 kw (Not Rotating)			Blade Length	
Tested: 8/4/2011				
Ferrite	3.012	Hz	128	in.
Neo	2.703	Hz	134	in.

Turbine Mounting:

- Provisions shall be made for mounting a furling winch, strain relief for tower wiring, tower climbing, anti-fall equipment and access holes where appropriate.
- The top of the tower shall be designed to allow the connection of the power cable and furling cable to the turbine via the two 2.3" diameter holes in the turbine's tower adapter plate.
- A connection shall be made between the turbine furling cable and the tower furling winch by using a tower furling cable assembly (11508-x), a 3/16" stainless steel thimble (HM3003) and two 3/16" stainless steel malleable clips (HM3002-B).
 - Furling cable, thimble, and clips must be purchased separately.
- Tower connection shall be made using either nine 5/8" bolts or six 3/4" bolts using the pattern illustrated below:



Attachment I

Electromagnetic Interference



2001 Priestley Ave.
Norman, OK 73069 USA
T: 405-364-4212
F: 405-364-2078
e-mail: sales@bergey.com
web: www.bergey.com

September 27, 2002

Jim Adams
AWS Scientific Inc.
Albany, NY 12203

Mr. Adams,

Regarding the concern that our wind turbines could cause interference in broadcast television reception: Bergey WindPower Company has been in continuous production of small-scale wind turbines for two decades. During that time, we have never received any reports of broadcast television signal interference resulting from the installation or operation of one of our machines. Bergey WindPower Company products have been tested by the U.S. Navy and approved for use in military communication applications.

Machines that employ large metal rotors, such traditional water pumping windmills, could potentially block broadcast signals and interfere with television reception. Because our equipment uses fiberglass composites rather than metal blades, our turbines are "transparent" to the TV broadcast signals.

Please feel free to contact me if you require any additional information.

Regards,

Steve Wilke

WINDLETTER

THE MONTHLY NEWSLETTER OF THE AMERICAN WIND ENERGY ASSOCIATION
Volume 22, Issue No. 4 - April 2003

SMALL TURBINE COLUMN:

Telecommunication Interference From Home Wind Systems

--Mick Sagrillo, Sagrillo Power & Light

This past week, I received three unusual phone calls from three wind system dealers in three different parts of the country. Their calls were regarding an issue brought up at the zoning hearings for their respective clients. All three calls were about any interference that the home-sized wind system might cause to a neighbor's TV or other telecommunications devices.

What a coincidence! I can only assume that something has recently been distributed on some anti-wind web site, or maybe published in the popular press, about home wind systems and telecommunications interference. Since this "problem" was news to me, I decided to thoroughly research these concerns with unbiased industry experts, namely Jim Green from the National Renewable Energy Laboratory (NREL), Paul Gipe, author of *Wind Power For Home and Business*, and Ken Starcher of the Alternative Energy Institute at West Texas A&M University.

The concerns raised by the zoning committees dealt with two basic ways in which the design of a wind turbine could potentially cause telecommunications interference.

The first is that the revolving blades could interfere with TV reception, "chopping up" the signal, which would result in a flickering image, or "ghosting," on the TV screen.

This problem has occasionally arisen with large utility-scale turbines. It turns out that this is a "line of sight" problem. That is, if a large utility-scale turbine is installed in the line of sight between the TV transmitter tower and a residential antenna, some chopping may, or may not, occur. The situation is easily rectified by either replacing the existing antenna with a larger, more powerful model or adding a reception booster to the antenna.

However, home-sized wind systems, in the 1 kW to 20 kW range, do not have the very large rotor diameters found on utility scale machines, and do not create ghosting interference. It's a valid concern for zoning committees and neighbors. But comparing home wind systems to utility scale equipment is sort of like comparing bicycles to semi trucks. While they both have wheels, and both get you from point A to point B, they are hardly comparable.

Ghosting did occasionally occur with a few home-sized wind systems available 20 or so years ago. The offending models all sported metal blades, which actually can reflect TV signals while rotating. However, this is ancient history, and home wind turbines are no longer available with metal blades. Today's home wind machines have blades made of wood, fiberglass, or plastic. All of these materials are "transparent" to telecommunications signals. Neither Jim Green nor Paul Gipe has heard of any problems concerning TV or telecommunications interference due to home wind systems.

The second concern is that the wind turbine's generator or alternator will emit electromagnetic interference or radio frequency interference, both of which could potentially interfere with telecommunications signals. Again, I came up empty handed regarding home-sized wind systems. Jim Green stated: "in the nearly 10 years I have worked in small wind, I have not encountered any incidents or problems related to electromagnetic emissions from small wind turbine generators. Consequently, studies have not been done on this topic, at least not to my knowledge."

Ken Starcher reported that "tests with power analyzers and observations at the Wind Test Center of the AEI-WTAMU campus showed no interference with radio/TV signals from the operation of (home wind turbines) or the electrical interface (from) renewable systems during the early 1990's."

Paul Gipe pointed out that "small wind turbines are used extensively worldwide to power remote telecommunication stations for both commercial and military uses. The turbines would never have been selected if there had been any hint of interference." Gipe goes on to add, "...[S]ome wind turbine operators have sought additional revenue by renting space on their towers for telecom dishes and antennas..."

Taking a lead from Gipe's comments, I decided to poll the manufacturers or their distributors about causing telecommunications interference. I was reminded that one of the major niche markets for home-sized wind systems is powering remote telecommunications sites. Applications include:

- cell phone towers,
- microwave repeater stations,
- radar installations for the FAA,
- military communications installations,
- wireless Internet sites,
- radio repeater stations,
- remote telemetry monitoring stations,
- remote telecommunications sites,
- TV and radio broadcast towers,
- ham radio sites,
- and sailboats (powered by micro wind turbines).

In addition, phone calls to Bergey WindPower, Southwest Windpower, Wind Turbine Industries, Proven Engineering, and African Windpower all revealed no complaints about communications interference due to any of their wind systems from any customer or their neighbors.

Finally, some home-sized wind turbines have been specifically tested for remote telecommunications applications, since stationary fossil fuel gen-sets can, and do, cause interference. For example, Bergey WindPower reports that, "their products have been tested by the U.S. Navy and approved for use in military communication applications." However, because they do not have a reputation for causing interference, and because they have long been used for remote telecommunications sites, most equipment has not been tested. To paraphrase NREL's Jim Green, no tests have been done, because there have been no complaints.

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[Editor's Note: The opinions expressed in this column belong solely to the author.]

Attachment J
SEQR Short Form EAF

5. Is the proposed action, a. A permitted use under the zoning regulations?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Consistent with the adopted comprehensive plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6. Is the proposed action consistent with the predominant character of the existing built or natural landscape?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
7. Is the site of the proposed action located in, or does it adjoin, a state listed Critical Environmental Area? If Yes, identify: _____	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. a. Will the proposed action result in a substantial increase in traffic above present levels?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Are public transportation service(s) available at or near the site of the proposed action?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Are any pedestrian accommodations or bicycle routes available on or near site of the proposed action?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Does the proposed action meet or exceed the state energy code requirements? If the proposed action will exceed requirements, describe design features and technologies: _____	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Will the proposed action connect to an existing public/private water supply? If No, describe method for providing potable water: _____	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Will the proposed action connect to existing wastewater utilities? If No, describe method for providing wastewater treatment: _____	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. a. Does the site contain a structure that is listed on either the State or National Register of Historic Places?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Is the proposed action located in an archeological sensitive area?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. a. Does any portion of the site of the proposed action, or lands adjoining the proposed action, contain wetlands or other waterbodies regulated by a federal, state or local agency?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Would the proposed action physically alter, or encroach into, any existing wetland or waterbody? If Yes, identify the wetland or waterbody and extent of alterations in square feet or acres: _____	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Identify the typical habitat types that occur on, or are likely to be found on the project site. Check all that apply: <input type="checkbox"/> Shoreline <input type="checkbox"/> Forest <input type="checkbox"/> Agricultural/grasslands <input type="checkbox"/> Early mid-successional <input type="checkbox"/> Wetland <input type="checkbox"/> Urban <input type="checkbox"/> Suburban			
15. Does the site of the proposed action contain any species of animal, or associated habitats, listed by the State or Federal government as threatened or endangered?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Is the project site located in the 100 year flood plain?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
17. Will the proposed action create storm water discharge, either from point or non-point sources? If Yes, a. Will storm water discharges flow to adjacent properties? <input type="checkbox"/> NO <input type="checkbox"/> YES b. Will storm water discharges be directed to established conveyance systems (runoff and storm drains)? If Yes, briefly describe: <input type="checkbox"/> NO <input type="checkbox"/> YES	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

18. Does the proposed action include construction or other activities that result in the impoundment of water or other liquids (e.g. retention pond, waste lagoon, dam)? If Yes, explain purpose and size: _____	NO	YES
_____	<input checked="" type="checkbox"/>	<input type="checkbox"/>
19. Has the site of the proposed action or an adjoining property been the location of an active or closed solid waste management facility? If Yes, describe: _____	NO	YES
_____	<input checked="" type="checkbox"/>	<input type="checkbox"/>
20. Has the site of the proposed action or an adjoining property been the subject of remediation (ongoing or completed) for hazardous waste? If Yes, describe: _____	NO	YES
_____	<input checked="" type="checkbox"/>	<input type="checkbox"/>
I AFFIRM THAT THE INFORMATION PROVIDED ABOVE IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE Applicant/sponsor name: <u>Sustainable Energy Developments, Inc.</u> Date: <u>Feb 20, 2015</u> Signature: <u>Matt Vanderbrook</u>		

Attachment J
SEQR Short Form EAF

Short Environmental Assessment Form

Part 1 - Project Information

Instructions for Completing

Part 1 - Project Information. The applicant or project sponsor is responsible for the completion of Part 1. Responses become part of the application for approval or funding, are subject to public review, and may be subject to further verification. Complete Part 1 based on information currently available. If additional research or investigation would be needed to fully respond to any item, please answer as thoroughly as possible based on current information.

Complete all items in Part 1. You may also provide any additional information which you believe will be needed by or useful to the lead agency; attach additional pages as necessary to supplement any item.

Part 1 - Project and Sponsor Information			
Sustainable Energy Developments, Inc.			
Name of Action or Project: Spoth Small Wind Turbine Installations			
Project Location (describe, and attach a location map): 9300 Wolcott Road Clarence, NY 14031			
Brief Description of Proposed Action: Installation of two residential-scale wind turbines for on-site energy use. Project will consist of two Bergey Excel 10kW wind turbines situated on 140 ft. steel self-supporting lattice towers. The turbines at the highest points (blade vertical above nacelle) will total ~153.8 ft. in height. The wind turbines will be interconnected behind the customer's meters to offset on-site electric consumption. Each wind turbine will require the excavation of a 21 ft. x 21 ft. area, 6 ft. in depth for the foundations, that will be backfilled so that only 3 piers to bolt the legs of the tower will be visible above ground. An estimated 275' trench will be required to run conduit and cabling from the wind turbine to the existing electrical service.			
Name of Applicant or Sponsor: Sustainable Energy Developments, Inc.		Telephone: 585.265.2384	
		E-Mail: matt@sed-net.com	
Address: 317 Route 104			
City/PO: Ontario		State: NY	Zip Code: 14519
1. Does the proposed action only involve the legislative adoption of a plan, local law, ordinance, administrative rule, or regulation?		NO	YES
If Yes, attach a narrative description of the intent of the proposed action and the environmental resources that may be affected in the municipality and proceed to Part 2. If no, continue to question 2.		<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Does the proposed action require a permit, approval or funding from any other governmental Agency?		NO	YES
If Yes, list agency(s) name and permit or approval: Use Variances ~ Town of Clarence PON 2439 Onsite Small Wind Incentive Program ~ NYSEDA		<input type="checkbox"/>	<input checked="" type="checkbox"/>
3.a. Total acreage of the site of the proposed action?		29.2 acres	
b. Total acreage to be physically disturbed?		<0.4 acres	
c. Total acreage (project site and any contiguous properties) owned or controlled by the applicant or project sponsor?		~28.9 acres	
4. Check all land uses that occur on, adjoining and near the proposed action.			
<input type="checkbox"/> Urban <input type="checkbox"/> Rural (non-agriculture) <input type="checkbox"/> Industrial <input type="checkbox"/> Commercial <input type="checkbox"/> Residential (suburban) <input type="checkbox"/> Forest <input checked="" type="checkbox"/> Agriculture <input type="checkbox"/> Aquatic <input type="checkbox"/> Other (specify): _____ <input type="checkbox"/> Parkland			

Attachment K

Small Wind Turbines and Shadow Flicker

North Wind Measurement - Technical Note

Shadow Flicker Impact for Small Wind Systems

A guide for wind turbine ordinances in Michigan

Many municipalities are currently writing or revising ordinances for small wind systems. Ordinances often require that the applicant provide a shadow flicker analysis as part of the permitting process. A commercial study can cost as much as \$1000 which, when added to the other requirement, represents a significant and often unnecessary burden on the homeowner.

This paper provides guidelines that can greatly simplify the shadow flicker evaluation process and avoid both cost for the homeowner and unnecessary administrative issues for the municipality.

Shadow flicker is seldom an issue for small wind systems for two reasons:

1. The shadow cannot be cast beyond 12 rotor diameters, which is often within the setback requirements for the turbine.
2. The sun cannot cast a shadow on the receptor if the turbine is to the north or south, so about 1/2 of possible turbine-to-receptor orientations cannot create shadow flicker.

Definitions

Shadow Flicker - Shadow flicker is the phenomenon where the blades of a rotating wind turbine cast a moving shadow on an observation point (receptor). The moving shadow causes the interior of a room to have recurring light and dark periods which can make it difficult to perform tasks that require a constant light source. This is most commonly observed in the hour just after sunrise or just before sunset when the sun is low in the sky. Shadow flicker is not the sun seen through a rotating blade nor what an observer might view moving through the shadows of a wind turbine system.

Small Wind System - A turbine with a rating 20 kw or less, sized for onsite energy use for a home or farm, and connected under Michigan's netmetering provisions.

Receptor - typically the occupied residence of an adjacent homeowner.

HAWT - Horizontal Axis Wind Turbine. The most common small wind turbine systems.

VAWT - Vertical Axis Wind Turbine. Systems whose rotational axis is vertical. Typically small, low-output systems usually used for demonstration projects. They have no potential for shadow flicker because the blades are small and the hub height is low.

Rotor Diameter - the diameter of the blades of a HAWT.

Hub Height - the height of the center of the turbine

Azimuth - the direction in degrees (true) from the receptor to the turbine. (north = 0 deg, east = 90 deg, south = 180 deg, west = 270 deg).

The following two guidelines will determine if shadow flicker is a potential problem and if a study should be performed. If both conditions are met, a study should be performed.

1. Is the receptor within 12 rotor diameters of the turbine? If the receptor is beyond 12 rotor diameters, no shadow flicker study is required. The shadow will dissipate before it reaches the receptor.
2. Is the azimuth (from receptor to turbine) within the possible shadow flicker range?
 - 65 to 160 degrees for sunrise exposure, or
 - 200 to 295 degrees for sunset exposure

If it is not in this range, shadow flicker cannot occur on the receptor.

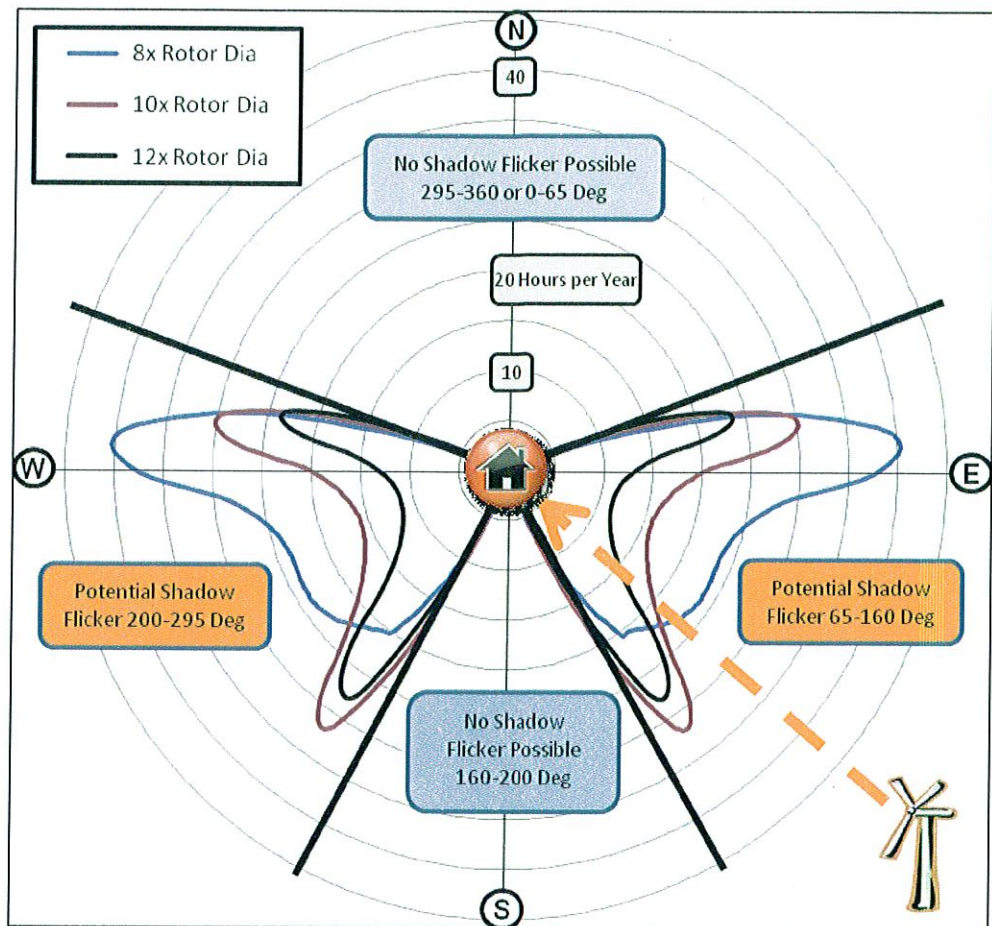
The "butterfly" plot shown is typical of shadow flicker impact possible in Michigan. Azimuths within the butterfly plot are of concern and should be analyzed.

Reading the Plot

- The turbine can only impact the receptor if it is installed in one of the "Potential Shadow Flicker" directions.
- The three "butterflies" represent distances from the receptor to the turbine. The closer (8x) will produce shadow flicker for more hours per year than the farther 12x distance.
- The concentric rings represent the number of hours per year that the shadow will be cast on the receptor

Assumptions for the plot

- Receptor is a 2000 square foot, two story home (35 x 35 ft x 20 ft high)
- Turbine is a 10 kw, 24 ft rotor diameter on a 100 ft tower
- Exposure hours are adjusted for sunshine probability and turbine operation probability.
- Plot is valid for latitudes from 42 to 47 degrees.



Shadow Flicker Characteristics for Common Small Wind Turbines

Model	Rotor Diameter (ft)	Maximum Shadow Distance (ft)	Rating (kw)	Flicker Frequency (Hz)
Skystream 3.7 or Proven WT2500	12	144	2.4	0 - 15
Bergey Excel or ARE 442	23	276	10	0 - 8.0
Jacobs 31-20	31	372	20	0 - 5.0

Flicker Frequency and Potential Health Issues

Small wind turbines will produce a flicker frequency from 0 to 15 Hz, depending on rotor size. There is evidence that about 1 person in 5000 in the United States is sensitive to frequencies between 3 and 25Hz and could suffer photosensitive epileptic seizure if exposed for a period of time. There has never been a case of a seizure occurring from wind turbine flicker, but it is a known phenomenon that has occurred from exposure to video games and cartoons.

The US Epilepsy Foundation has several papers on the subject:

<http://www.epilepsyfoundation.org/about/photosensitivity/>

Attachment L

Bird Mortality and Small Wind Turbines

A Study of the Potential Effects of a Small Wind Turbine on Bird
and Bat Mortality at Tom Ridge Environmental Center
Erie, Pennsylvania

Kenneth W. Andersen
Gannon University

12 December, 2008

INTRODUCTION

In 2006 the Pennsylvania Department of Conservation of Natural Resources (DCNR) elected to place a 10 kW wind turbine at Tom Ridge Environmental Center (TREC) and six other environmental centers within the commonwealth for the purpose of enhancing public education about alternative energy sources. The 120 ft. unit was erected in early May, 2007 (Fig. 1, 2). Because there is evidence of bird and bat kills at some sites with much larger generating turbines (mW) (e.g., <http://www.abcbirds.org/conservationissues/threats/energyproduction/wind.html>) the DCNR wanted to know if there was reason to be concerned about erecting smaller units. A survey for literature that addressed this issue revealed no formal studies and only a few anecdotal reports which indicated that they do not present a threat to birds and bats (e. g., www.bergey.com/; http://www.awea.org/smallwind/faq_general.html#Dosmallwindturbineskillbirds).

An investigation of the effect of the wind turbine unit at TREC on bird and bat mortality was initiated in fall, 2006 and continued through spring, 2008. Besides monitoring for carcasses of birds and bats in the vicinity of the tower, the study determined what species of birds and bats occurred in the immediate area and evidence of their activity near the tower. This report provides an overview of the study and its results while specific investigations on bird and bat activities at the site continue to be analyzed for subsequent publication.

THE STUDY AREA

The TREC is located on a bluff near Lake Erie (42.1098°N, 80.1538°W) near the entrance to Presque Isle State Park (PISP), Erie County, Pennsylvania. Its location occupies the site of a former outdoor movie theater. To its north the terrain drops steeply

into Scott Run which drains into Presque Isle Bay. Deciduous trees and shrubs dominate the vegetation of the slope and a narrow band of trees occur on the lip of the bluff (Fig. 3, 4). A seven acre parking lot designed to accommodate several hundred vehicles and landscaped with young native trees, shrubs, and herbaceous plants occupies space to the south of TREC, while the wind turbine stands on a grassy knoll approximately 35 yards to the southeast of the building (Fig. 1).

METHODS

Survey of birds

Two types of bird surveys were conducted. One was through direct observations with identifications made by either sight or song recognition. Observations were made as the surveyor slowly walked through the area over a period of one hour per visit. Multiple visits were made monthly from October, 2006 through early October, 2007 (Table 1). Besides the identification of species present their activity and habitat usage were also recorded (Table 2).

The other survey involved the recording of the night flight calls of migrating birds through the use of microphones mounted on the roof of TREC (Figs. 5, 6) during the periods of 1 June-11 October, 2007 and 17 April-16 June, 2008. The calls were recorded and stored on computers for later analysis (Fig.7). The construction of microphones followed the general design presented by Old Bird (2005). Four of these microphones were placed on the roof for monitoring in 2007. In spring, 2008 the monitoring was switched to one microphone mounted on the top of the TREC observation tower and one on the theater roof.

Survey of bats

The presence of bats was determined at night by recording their ultrasound calls through the use of an AR 125 Ultrasonic Receiver (Binary Acoustic Technology) and laptop computer. The system was programmed to turn on each night near sunset and to turn off near sunrise. Recordings were made from 5 June-29 October, 2007 and 20 April-15 July, 2008. The system was mounted approximately 8 ft. off ground under the protection of a loading port roof at TREC and was approximately 28 yards from the base of the tower. The detector was contained within weather proof housing and was aimed to collect high frequency sounds from an area between the port and the wind turbine (Fig. 8).

Search for carcasses

Searches for carcasses of birds and bats was initiated on 25 May, 2007 and continued on a nearly daily basis through 7 July 2008 when the study ended (DCNR employees continue to monitor the site daily as of this writing). The search area included the mowed grassy area around the turbine tower and part of the adjacent parking lot (Fig. 1). Its perimeter was roughly a radius of 30 yards from the tower base. The survey was conducted by walking along lines approximately 10 ft. apart in early morning and sometimes at night to help ensure that specimens were not removed by scavengers before the morning check. Nocturnal surveys, requiring approximately 1 hour per visit, were conducted May and June, 2008 on the following dates and times: 11:00 pm---June 1,2,4,8,9,11,12,14-17,24-28; 11:30 pm---May 25,27,30,31, June 1; 3:00 am---May 29, June 1,2,14,16,19-22. Because May and June are months of heavy migration, the morning surveys occurred at sunrise to mitigate the possibility of carcasses being removed by scavengers. Otherwise, morning surveys were generally conducted between the hours of 7:00 and 8:00 am.

The possible presence of scavengers was monitored with an infra-red motion sensing camera (Silent Image, Model RM30) installed near the facility in such a way as to cover a portion of area between the bluff and tower. It was operational on 14 nights from 29 May through 30 June, 2007.

RESULTS

One bird, a common grackle (*Quiscalus quiscula*) was found dead in the search area on 2 July, 2008 and sent to the Pennsylvania Game Commission for evaluation. The cause of its demise is undetermined but no external injuries were noted. No other bird or bat carcasses were noted throughout this study.

The survey camera was limited to scanning roughly one quarter of the total area being surveyed for carcasses. During the 14 nights of running it recorded a white-tailed deer (*Odocoileus virginianus*) on 29 May, a raccoon (*Procyon lotor*) on 12 June, and a woodchuck (*Ondatra zibethicus*) on 22 June. Throughout the study raccoons and striped skunks (*Mephitis mephitis*) were occasionally noted by the author and anecdotal reports of the presence of these species in the vicinity were given by employees of TREC. No other potential scavengers such as fox and feral cats were seen at the site.

Over 250 species of birds have been reported being present at Presque Isle State Park (McWilliams and Brauning, 1999), and because of the close proximity of TREC to PISP it is probable that at some time many of these could be present or at least fly over the study area. Our inventory of the site revealed the presence of at least 83 species, of which 19 species gave evidence of using the general area of the site during the period of reproduction (Table 1). A small colony of bank swallows (*Riparia iparia*) nested in a bank close to the tower during summer 2007 and 2008 (Fig. 9). Many individuals of this species were often observed aerial feeding on a regular basis at the height of the turbine

and close to it. During the survey approximately 35 percent of all bird species were in flight and 12 percent were observed at heights of 75 feet or greater. The majority were observed feeding or resting in vegetation or ground (Table 1).

Unfortunately, the sensitivity of the four microphones installed to record nocturnal flight calls appear to have been enough different to prevent comparisons between them (Lanzone, et. al., 2007). However, based primarily on results from one microphone, number 1 (Fig. 5), the number of calls averaged highest just prior to sunrise and were lowest in early night hours. In fall, 2007 the peak in call rates occurred in mid September and tapered to few by 11 October. A mix of sparrows, warblers, and thrushes made up the vast majority of the calls. Recordings for spring, 2008 are still being analyzed and preliminary results show that from mid-April through mid-June there was a steady movement of migrant songbirds (warblers, sparrows and thrushes) over the site (Lanzone, in prep). Calls were recorded every night from 18 April through 12 June but the number of calls recorded dropped to just 1-7 per night after 24 May. The highest number of calls recorded in one night was the night of 1 May with 200 calls. An average of 34 calls was recorded 18 April-24 May. Additional calls of unidentified shore birds were recorded in low numbers in May and June as well.

Nightly activity of bats was recorded at the site beginning in mid-April and ended in mid- October. Bat activity was recorded nightly From 5 June until 29 October, 2007. Nightly recordings were resumed on 19 April, 2008 and continued through 7 July, 2008. The six species that were tentatively identified through call identification include hoary bat (*Lasiurus cinereus*), red bat (*Lasiuris borealis*), silver-haired bat (*Lasionycteris noctivagans*), eastern pipistrell (*Pipistrellus subflavus*), big brown bat (*Eptesicus fuscus*),

and little brown bat (*Myotis lucifugus*). The identity confirmation and activity of these species during the periods of recordings is currently under study (Andersen, in prep).

DISCUSSION

Evidence from this study suggests that the probability of bird and bat mortalities being caused by collisions with small monopod wind turbines is low. The apparent absence of multiple deaths of birds or bats at the other six sites (H. Leslie, pers. comm.) supports this evidence. At the TREC site a diversity of songbirds are using the area daily without turbine related casualties (Table 1, 2) and the same is apparent with bats that are active nightly during their seasonal occurrence (Andersen, in prep).

That some birds and bats may have been killed by colliding with the unit but not found during daily surveys is possible. The confirmation of the presence of raccoon and striped skunk at the site on occasion suggests that carcasses could have been scavenged by these mammals. However, on the few occasions that skunk were known to be present they would be searching the ground for grubs and other invertebrates. When observed, the raccoons always appeared to be in transit rather than searching for food. Although the elevation of flight for migrating birds at night was not ascertained for the site, it is generally shown that they are above 100 meters (see Barclay, et al, 2007). An exception may be when very low clouds would cause them to fly lower. Such conditions were not recorded at the site during this investigation. Diurnal bird flight often is at much lower levels as witnessed at the site. However, our observations recorded no collisions with the tower or turbine blades during the day. Migrating bats tend to fly lower than birds and those individuals recorded throughout the spring and summer seasons while flying in the vicinity of the tower were generally at tower height or lower because the maximum range of the detector being used is estimated to be approximately 125 ft. (Donovan T., et. al,

2007). As with birds during daylight the bats apparently avoided collisions with the facility.

A study of the effects of wind tower heights and blade sizes on rates of bird and bat mortalities found that towers shorter than 65 m caused relatively few deaths (Barclay, E. F., et al., 2007). This, along with the apparent lack of the reports of multiple deaths associated with small wind turbines supports our findings.

Table 1. Dates for bird surveys at TREC and numbers of species observed at key points of sighting.

Date	Parking Lot	Lawn ¹	Ravine/Edge ²	Overhead High ³	Overhead Low ⁴
10/23/2006	50	2	6	1	2
10/27/2006	0	0	0	1	1
10/30/2006	0	1	9	0	5
11/6/2006	0	2	9	0	2
11/15/2006	3	0	3	0	2
11/20/2006	0	1	2	1	0
11/27/2006	2	0	5	2	4
12/4/2006	1	1	8	2	5
12/11/2006	1	5	12	1	3
12/19/2006	1	0	6	0	1
1/2/2007	3	1	4	0	2
1/15/2007	2	1	8	2	3
1/28/2007	0	0	4	0	1
2/12/2007	2	0	5	0	1
2/19/2007	1	0	6	1	0
2/26/2007	2	1	8	0	1
3/5/2007	2	0	7	2	3
3/12/2007	2	1	9	9	9
3/13/2007	0	0	0	9	11
3/20/2007	3	1	11	4	7
3/21/2007	1	0	1	2	7
3/22/2007	0	0	0	8	10
3/24/2007	0	0	0	1	1
3/26/2007	3	4	10	5	24
4/9/2007	5	3	12	2	3
4/16/2007	1	2	5	3	4
4/22/2007	5	10	16	1	3
4/23/2007	0	1	1	13	16
4/29/2007	3	3	13	2	6
5/7/2007	7	6	19	5	7
5/14/2007	7	6	14	3	9
5/28/2007	5	2	19	3	6
6/11/2007	3	4	15	3	6
6/18/2007	11	6	11	5	8
6/24/2007	6	5	16	3	3
7/2/2007	5	5	15	1	5
7/9/2007	4	2	10	1	4
7/23/2007	6	4	9	2	7
8/1/2007	9	6	12	3	4
8/6/2007	4	1	9	2	3
8/13/2007	6	2	4	2	6
8/21/2007	5	5	8	3	4
8/27/2007	10	3	6	3	5
9/10/2007	4	3	10	2	5
9/17/2007	1	1	9	6	2
9/23/2007	3	1	9	2	6
9/24/2007	3	0	6	0	2
10/15/2007	5	2	14	2	2
10/22/2007	2	1	8	3	1
Summed	149	105	403	126	232
	0.14679803	0.103448276	0.397044335	0.124137931	0.228571429
Approx usage	15%	10%	40%	12%	23%

¹all grassy areas adjacent to TREC; ²tree line and general area of Scott Run; ³above the top of TREC observation tower (approx. 75 ft.); ⁴below the top of TREC observation tower; ⁵number or species observed during 1hr. of observation

Table 2. Bird Species Observed at TREC, 23 October 2006-22 October 2007

Double-crested Cormorant	Ruby-throat Hummingbird	Eastern Bluebird ³
Great Blue Heron	Red-bellied Woodpecker	Wood Thrush
Canada Goose	Yellow-bellied Sapsucker	Swainson's Thrush
Wood Duck	Downy Woodpecker ³	Hermit Thrush
Mallard	Hairy Woodpecker	American Robin ³
Northern Pintail	Northern Flicker	Gray Catbird ³
Unidentified Waterfowl	Pileated Woodpecker	Brown Thrasher
Turkey Vulture ¹	Eastern Phoebe ³	Cedar Waxwing
Black Vulture ¹	Eastern Wood-Pewee	European Starling ³
Osprey ¹	Great Crested Flycatcher	Yellow Warbler ³
Bald Eagle ¹	Unidentified Flycatcher	Wilson's Warbler
Northern Harrier ¹	Warbling Vireo	Scarlet Tanager
Sharp-shinned Hawk ¹	Red-eyed Vireo	Northern Cardinal ³
Cooper's Hawk ¹	Purple Martin	Rose-breasted Grosbeak
Unidentified Accipiter ¹	Tree Swallow	Eastern Towhee
Red-shouldered Hawk ¹	Barn Swallow	American Tree Sparrow
Broad-winged Hawk ¹	Bank Swallow ³	Chipping Sparrow ³
Red-tailed Hawk ¹	Blue Jay ³	Field Sparrow
Rough-legged Hawk ¹	American Crow ³	Song Sparrow ³
Unidentified Buteo ¹	Common Raven ¹	White-throated Sparrow
American Kestrel ¹	Black-capped Chickadee ³	White-crowned Sparrow
Merlin ¹	Tufted Titmouse ³	Dark-eyed Junco
Peregrine Falcon ¹	White-breasted Nuthatch	Red-winged Blackbird
Wild Turkey ²	Red-breasted Nuthatch	Eastern Meadowlark
Killdeer ³	Brown Creeper	Common Grackle
Ring-billed Gull	Carolina Wren	Brown-headed Cowbird ³
Herring Gull	House Wren ³	Baltimore Oriole ³
Unidentified Gull/Tern	Winter Wren	House Finch ³
Mourning Dove	Golden-crowned Kinglet	American Goldfinch
Chimney Swift	Ruby-crowned Kinglet	House Sparrow ³

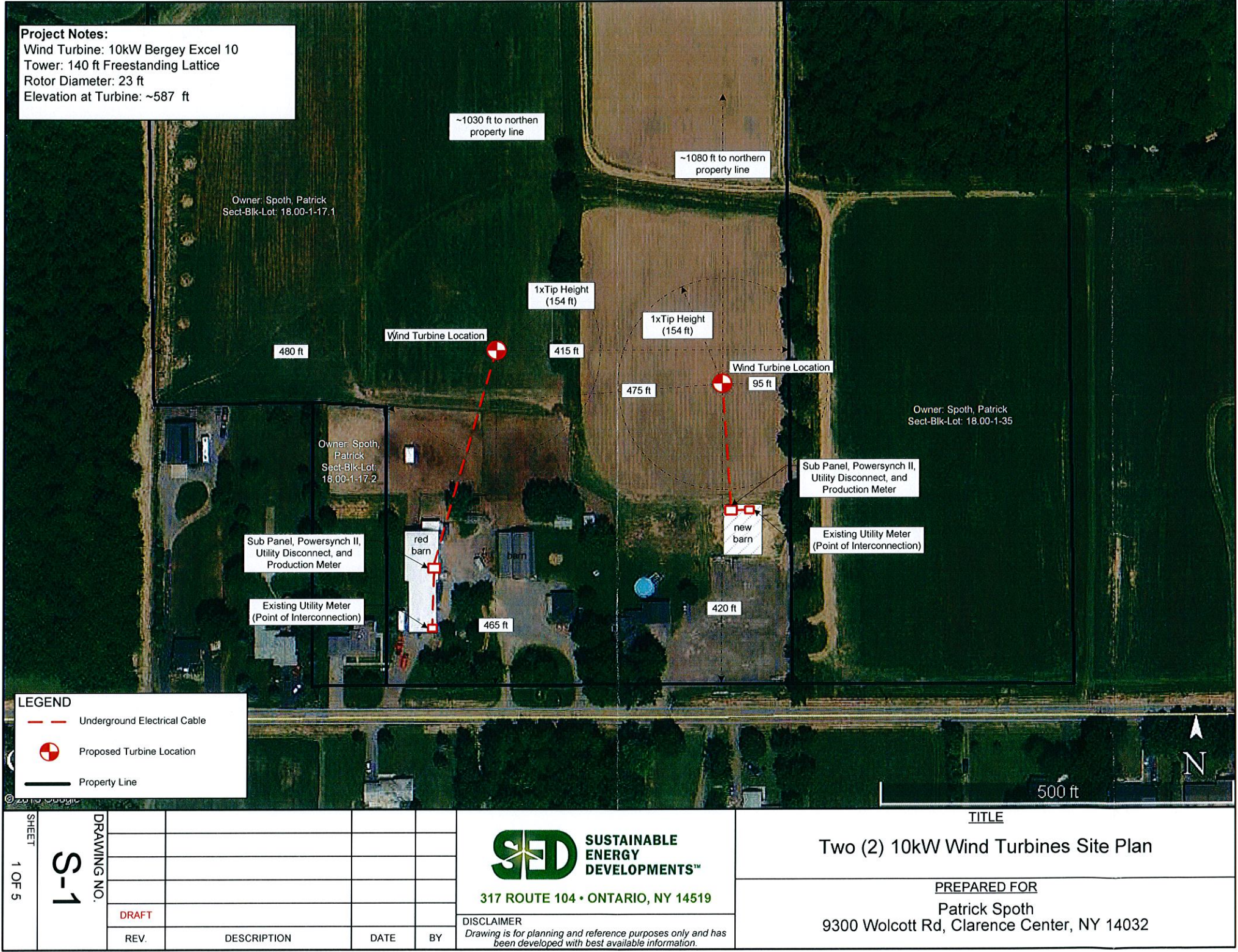
¹Species observed and identified on one or more of the following dates: 3/22, 3/26, 4/23, 2007 (J. McWilliams, pers. com.).

²Species in **bold** were observed during the potential breeding season of May - mid-August.

³Evidence of site usage for breeding (e.g., nests, fledglings) was identified for these species.

Literature Cited

- Andersen, K. W. Bat activity at Tom Ridge Environmental Center, Erie, Pennsylvania. In Prep.
- Andersen, K. W. 2007. Small wind turbines, birds and bats: a study underway at TREC. Abstract. Regional Science Consortium 3rd Annual Research Symposium
- Barclay, R., M. R., Baerwaid, E. P., and Gruver, J. C. 2007. Variation in bat and bird fatalities at wind energy facilities: assessing the effects of rotor size and tower height. *Can. J. Zool.* 85:381-387.
- Donovan T., K. Watrous, D. Olufson. 2007. Field Tests of Acoustical Monitoring for Bats. http://www.uvm.edu/envnr/vtcfwru/Current_Projects/acoustics.htm
- Lanzone, M. Analysis of nocturnal flight calls of migrant birds at Tom Ridge Environmental Center, Erie, Pennsylvania. In Prep.
- Lanzone, M., Coulter, B. DeLeon, E., and Grove, L. 2007. A preliminary report of flight calls recorded at Tom Ridge Environmental Center. Unpublished Manuscript, 13 pp. Powdermill Avian Research Center Bioacoustics Lab.
- McWilliams, G. M., and D. W. Brauning, 1999. The birds of Pennsylvania. Comstock Publ. Assoc. Ithaca, NY.
- Old Bird. 2005. Microphone design and building instructions. http://www.oldbird.org/mike_home.htm
- Spittler, J., Andersen, K. W., Ropski, S. 2007. Bat activity near a small wind turbine: a study underway at TREC. Abstract. Regional Science Consortium 3rd Annual Research Symposium.





Equipment Notes

- 1 Square D Safety Switch, NEMA 3R, 3-Pole Heavy Duty, 600V, 60A, Fusible – (3) 45Amp Fuses, with Delta LA603 Lighting Arrestor Mounted on Bottom of Safety Switch - Mounted at Tower Base. Labeled with "Warning – Electric Shock Hazard, Terminals on both the line and load sides may be energized in open position".
- 2 Powersync II Power Converter – 240V Diversified Technology Inc. Model AMFA-29 with three (3) 50Amp Bussmann JJS-50 Fuses (Turbine Side)– Mounted inside red barn on wall, Labeled as "Power Converter"
- 3 Dedicated kWh Cyclometer – Hialeah Watt Hour Meter – Mounted inside red barn on wall next to Power Converter, Labeled as "Dedicated Meter"
- 4 Cutler Hammer Safety Switch, NEMA 3R, 60 A, 120/240Vac Non-Fusible – Mounted inside red barn on wall in plain view, Labeled as "Wind Generator Disconnect" – (see attachment)
- 5 200 Amp Sub-Panel w/ MCB or MLO – Power Converter Fed with a 2 Pole 70 Amp Breaker, and APT TE/C Series Surge Protective Device Powered by a 2 Pole 20 Amp Breaker, Labeled as "Distribution Panel"
- 6 100 Amp Service Disconnect breaker – Located adjacent to service tap, Labeled as "Service Disconnect"
- 7 Existing 200 Amp Main Distribution Panel – Located inside red barn, Labeled as "Main Load Center"
- 8 Existing Utility kWh Cyclometer – Mounted on outside of red barn, Labeled as "Utility Meter", Along with "Location and Distance to Disconnect" – If Not in Direct Sight of Disconnect a Map Showing the Location of Disconnect will be Attached/Mounted Next to the Meter
- 9 Service tap off of 4/0 AWG aluminum service wire to #2 AWG THHN aluminum using IlSCO "Kup- L-Tap" IPC 4/0 – 2/0 (for main conductor range 4/0 - 2/0 AWG and tap conductor range 2/0 - #6 AWG) 600V



Wire and Conduit Notes

- Grounding**
- 5/8" copper clad, 8 foot grounding electrodes will be placed around base pad of tower foundation in a ground loop connected via exothermic welds to bare #2 Copper. Three (3) bare #2 whips connect to ground loop via exothermic welds. These whips connect to tower via mechanical lugs. Tower disconnect switch is bonded to grounding loop via bare #2 copper to mechanical lug.
- Conduit**
- 2" Schedule 40 PVC Conduit Exterior Run (Buried Underground at 18" Depth From Tower to Pull Box) – Run Length: 140 ft Down Tower, 320 ft Underground to Barn
- Wire**
- 1 (3) #6 AWG THHN in Armored Cable from Turbine to Safety Switch Mounted at Base of Tower – Run Length: 140 ft
 - 2 (3) #2 AWG AL THHN with (1) #6 CU AWG THHN Green (Ground) in Conduit from Safety Switch at Base of Tower to Power Converter – Run Length: 320 ft
 - 3 (2) #2 AWG AL THHN with (1) #8 AWG THHN Green (Ground) in Conduit from Power Converter to Sub Panel - Run Length: 75 ft
 - 4 (3) #2 AWG AL THHN from Sub-Panel to main service conductors – Run Length: less than 50 ft

Total Wire Run (Turbine to Power Converter) – 320 ft

Wire Run Conductor Sized for Less than 4.5% Annual Energy Output Loss

SHEET 3 OF 5	DRAWING NO. E-2					 317 ROUTE 104 • ONTARIO, NY 14519 <small>DISCLAIMER Drawing is for planning and reference purposes only and has been developed with best available information.</small>	TITLE	
							10kW Three-Line Diagram Notes (East Site)	
							PREPARED FOR	
							Patrick Spoth	
							9300 Wolcott Rd, Clarence Center, NY 14032	
		DRAFT						
		REV.	DESCRIPTION	DATE	BY			



Equipment Notes

- 1 Square D Safety Switch, NEMA 3R, 3-Pole Heavy Duty, 600V, 60A, Fusible – (3) 45Amp Fuses, with Delta LA603 Lighting Arrestor Mounted on Bottom of Safety Switch - Mounted at Tower Base. Labeled with “Warning – Electric Shock Hazard, Terminals on both the line and load sides may be energized in open position”.
- 2 Powersync II Power Converter – 240V Diversified Technology Inc. Model AMFA-29 with three (3) 50Amp Bussmann JJS-50 Fuses (Turbine Side)– Mounted inside new barn on wall, Labeled as “Power Converter”
- 3 Dedicated kWh Cyclometer – Hialeah Watt Hour Meter – Mounted inside new barn on wall next to Power Converter, Labeled as “Dedicated Meter”
- 4 Cutler Hammer Safety Switch, NEMA 3R, 60 A, 120/240Vac Non-Fusible – Mounted inside new barn on wall in plain view, Labeled as “Wind Generator Disconnect” – (see attachment)
- 5 200 Amp Sub-Panel w/ MCB or MLO – Power Converter Fed with a 2 Pole 70 Amp Breaker, and APT TE/C Series Surge Protective Device Powered by a 2 Pole 20 Amp Breaker, Labeled as “Distribution Panel”
- 6 100 Amp Service Disconnect breaker – Located adjacent to service tap, Labeled as “Service Disconnect”
- 7 Existing 200 Amp Main Distribution Panel – Located inside new barn, Labeled as “Main Load Center”
- 8 Existing Utility kWh Cyclometer – Mounted on outside of new barn house, Labeled as “Utility Meter”, Along with “Location and Distance to Disconnect” – If Not in Direct Sight of Disconnect a Map Showing the Location of Disconnect will be Attached/Mounted Next to the Meter
- 9 Service tap off of 4/0 AWG aluminum service wire to #2 AWG THHN aluminum using IlSCO “Kup- L-Tap” IPC 4/0 – 2/0 (for main conductor range 4/0 - 2/0 AWG and tap conductor range 2/0 - #6 AWG) 600V



Wire and Conduit Notes

Grounding

5/8" copper clad, 8 foot grounding electrodes will be placed around base pad of tower foundation in a ground loop connected via exothermic welds to bare #2 Copper. Three (3) bare #2 whips connect to ground loop via exothermic welds. These whips connect to tower via mechanical lugs. Tower disconnect switch is bonded to grounding loop via bare #2 copper to mechanical lug.

Conduit

2" Schedule 40 PVC Conduit Exterior Run (Buried Underground at 18" Depth From Tower to Pull Box) – Run Length: 140 ft Down Tower, 170 ft Underground to new Barn

Wire

- 1 (3) #6 AWG THHN in Armored Cable from Turbine to Safety Switch Mounted at Base of Tower – Run Length: 140 ft
- 2 (3) #4 AWG AL THHN with (1) #6 CU AWG THHN Green (Ground) in Conduit from Safety Switch at Base of Tower to Power Converter – Run Length: 170 ft
- 3 (2) #4 AWG AL THHN with (1) #8 AWG THHN Green (Ground) in Conduit from Power Converter to Sub Panel - Run Length: less than 50 ft
- 4 (3) #2 AWG AL THHN from Sub-Panel to main service conductors – Run Length: less than 50 ft

Total Wire Run (Turbine to Power Converter) – 170 ft

Wire Run Conductor Sized for Less than 4.5% Annual Energy Output Loss

SHEET 5 OF 5	DRAWING NO. E-4					 <div>SUSTAINABLE ENERGY DEVELOPMENTS™</div> <div>317 ROUTE 104 • ONTARIO, NY 14519</div> <div>DISCLAIMER Drawing is for planning and reference purposes only and has been developed with best available information.</div>	TITLE	
							10kW Three-Line Diagram Notes (West Site)	
							PREPARED FOR	
							Patrick Spoth	
							9300 Wolcott Rd, Clarence Center, NY 14032	
		REV.	DESCRIPTION	DATE	BY			

**REQUEST FOR
ACTION BY:
TOWN OF CLARENCE, N.Y.**

☒ Appeal Board
☐ Planning Board
☐ Town Board

☒ Appeal
☐ Rezone
☐ Revise Ordinance
☐ Subdivision
☐ Limited Use Permit
☐ Other

Rec'd. by: Jonathan Bleuer

Date March 12, 2015

Action Desired Applicant requests a variance of 179.2 sq. ft. to allow for a 899.2 sq. ft. detached accessory structure located at 4780 Ransom Road, in the Residential Single Family Zone.

Reason Town Code Reference:
§229-55 (D)

PLEASE PRINT

Name	Richard Rockford		
Address	4780 Ransom Road		
	Clarence	NY	14031
Town/City	State	Zip	
Phone			
Signed	SIGNATURE ON FILE		

Requests for action on zoning should be filled out completely in above spaces if practicable; otherwise give brief description and refer to attached papers. The complete request with all necessary plans, maps, signatures, should be filed with the Secretary of the Planning Board. Requests (except appeals) may be filed with the Town Clerk or Town Board, but will generally be referred to Planning Board with subsequent loss of time.

Initial Action

Approved ☐
 Rejected ☐ by on 20
 Approved ☐
 Rejected ☐ by on 20
 Published (Attach Clipping) on 20
 Hearing Held by on 20

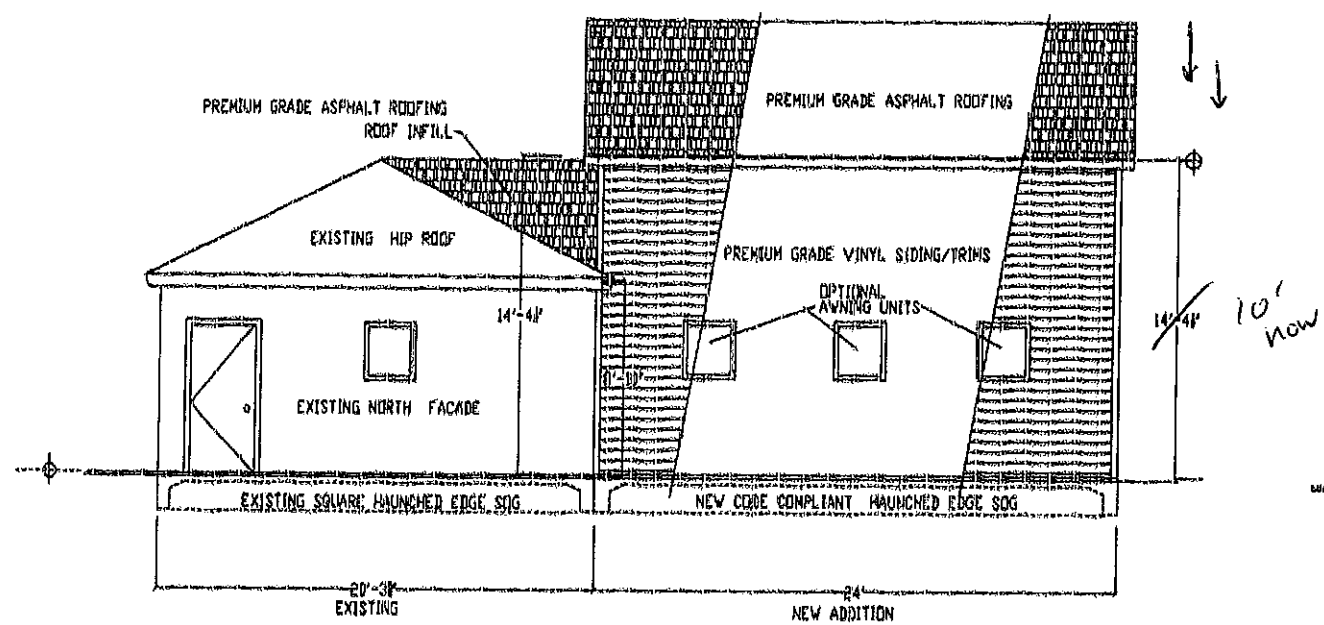
Final Action Taken

Approved ☐
 Rejected ☐ by on 20
 Published (Attach Clipping) on 20
 Filed with Town Clerk on 20
 Filed with County Clerk on 20

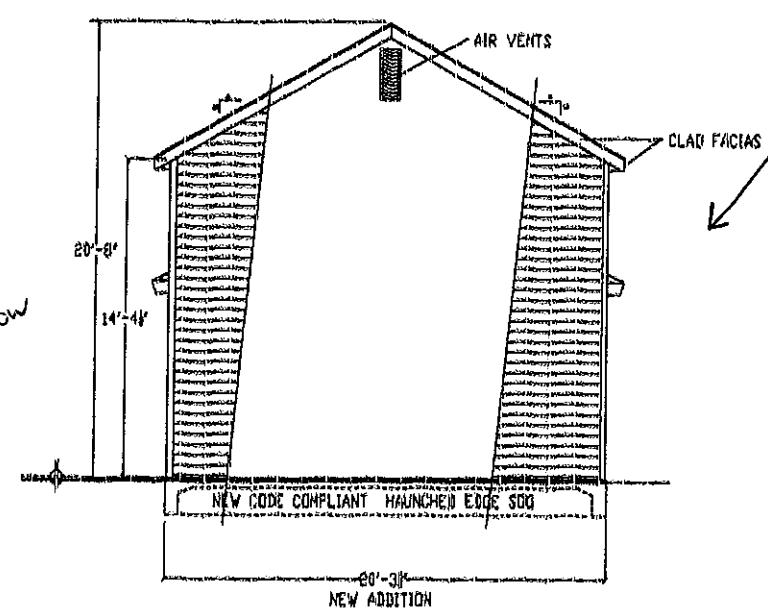
**ROCKFORD RESIDENCE
REAR GARAGE ADDITION**

4780 RANSOM ROAD

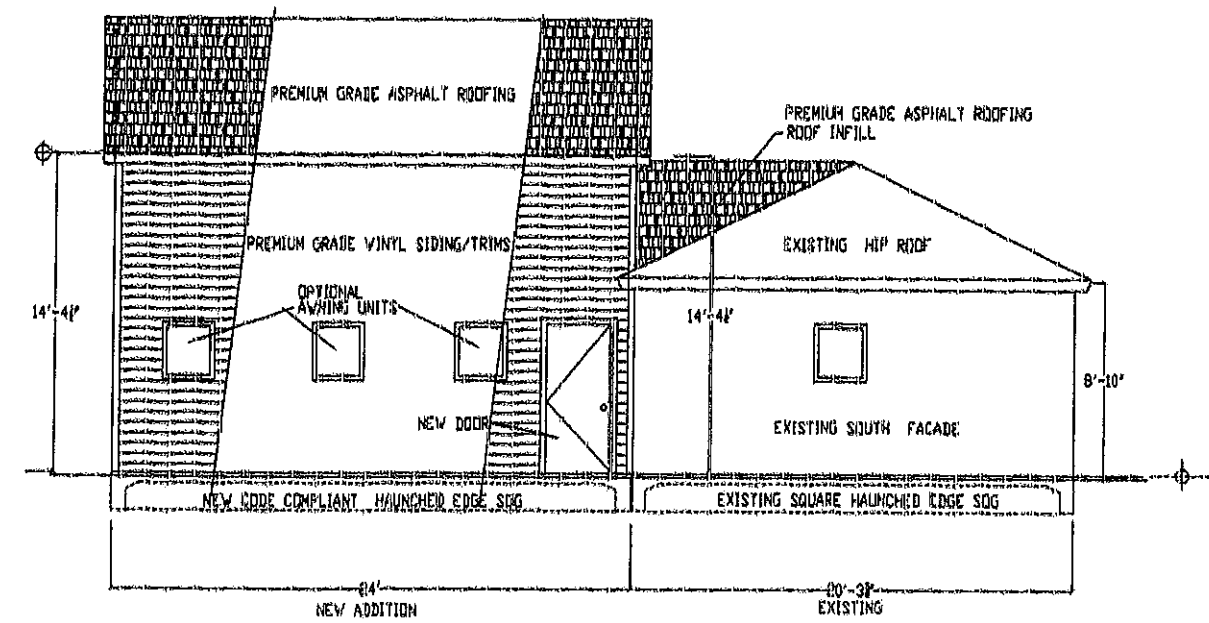
NOTE! - All addition walls
Revised to Approx
10' (Reduced from 14')
- Roof will be reduced
in height by approx
4'.



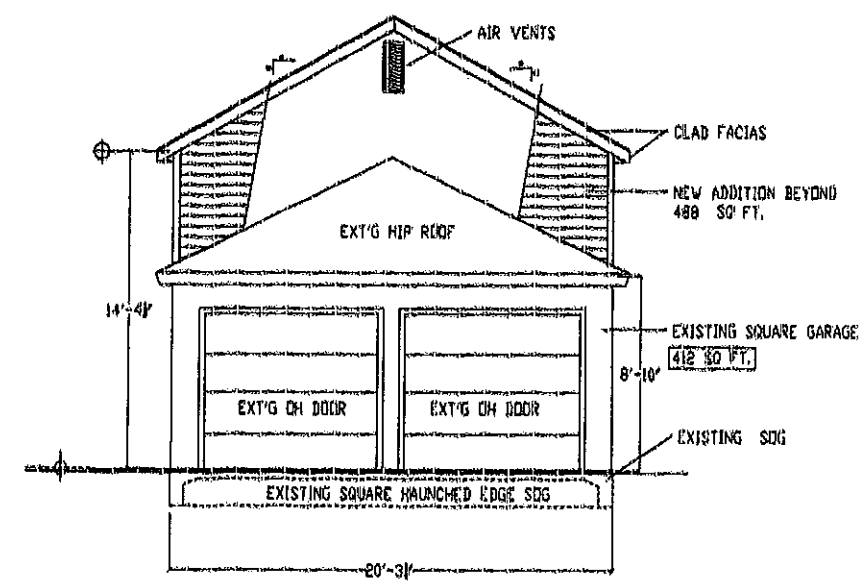
05 RIGHT SIDE ELEVATION
NORTH ELEVATION
1/4" = 1'-0"



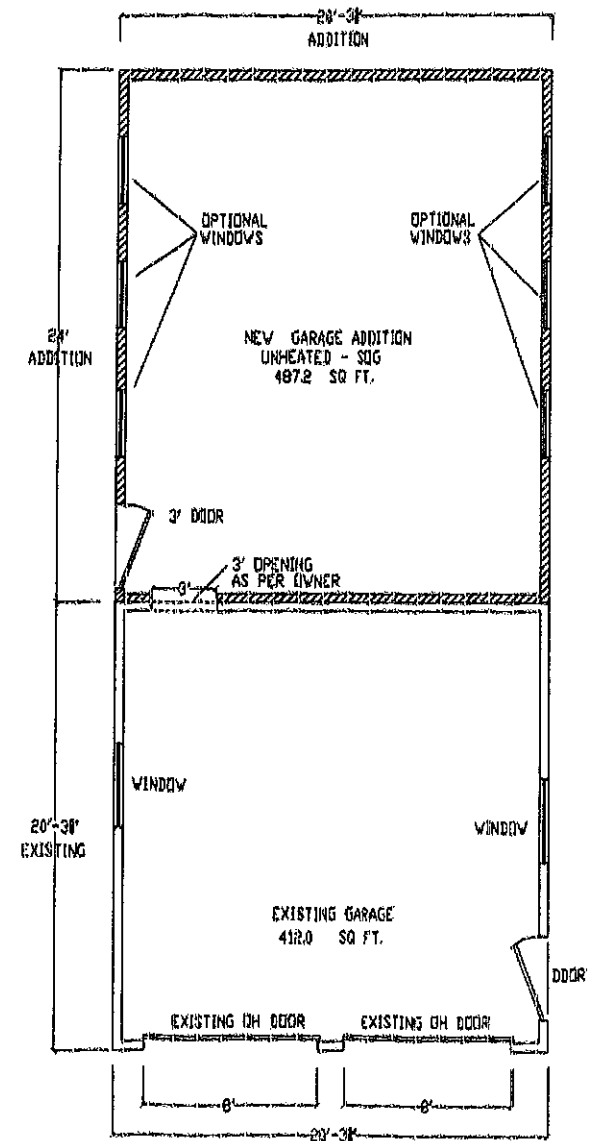
04 REAR ELEVATION
WEST ELEVATION
1/4" = 1'-0"



03 LEFT ELEVATION
SOUTH ELEVATION
1/4" = 1'-0"



02 FRONT ELEVATION
EAST ELEVATION
1/4" = 1'-0"



01 PLAN
EXISTING GARAGE 412.0 SQ. FT.
NEW GARAGE ADDITION 487.2 SQ. FT.
TOTAL 899.2 SQ. FT.
1/4" = 1'-0"

NO.	DESCRIPTION	DATE	BY	CHKD
1	PLAN, ELEVATIONS	10/15/15	WYLLIE	WYLLIE
2	REVISION	10/15/15	WYLLIE	WYLLIE

ROCKFORD RESIDENCE
REAR GARAGE ADDITION
100 RANSOM ROAD
CLARENCE, NEW YORK

Feet Inches
 0.08 - 1 inch
 0.17 - 2 "
 0.25 - 3 "
 0.33 - 4 "
 0.42 - 5 "
 0.50 - 6 "
 0.58 - 7 "
 0.67 - 8 "
 0.75 - 9 "
 0.83 - 10 "
 0.92 - 11 "
 1.00 - 12 "

EASTERLY LINE of
 2013 PG. 74

92.5'
 PARALLEL WITH RANSOM RD.

SOUTH LINE Lot 13. Sect. 1. T. 12. R. 6

459.0'

PARALLEL

459.0'

ADDITION
 487.2 SF

0.17N

FR. SHED
 0.435'

363'
 FR. GAR.

3.25'

20.30'
 FR. GAR. 20.30'

EXT'G.
 412 SF

34.25'

33.25'

ENC. 3-8'S

PARALLEL

ENC. 5-2'S

WOOD DECK

CELLAR ENT.

FRAME HOUSE
 NO. 4780

ROOFED PORCH

56.0'

PP
 0.25 40.2W

92.5'

10.57

WEST LINE of
 RANSOM RD.

RANSOM (49.5') RD.

NOTE: THIS SURVEY WAS PREPARED WITHOUT THE BENEFIT OF
 AN ABSTRACT OF TITLE AND IS SUBJECT TO ANY STATE
 OF FACTS THAT MAY BE REVEALED BY AN EXAMINATION
 OF SUCH.

SURVEY DATE	OCT. 1, 1990	SCALE:	1" = 30'
LOCATION	TOWN OF CLARENCE	JOB NO.	90.5572
COUNTY	OF ERIE, N.Y.		
PART	OF LOT 13. SECT. 1		
T. 12 R. 6			

AP COVER

CHARLES E. DENVER
 LICENSED LAND SURVEYOR
 N.Y.S. LICENSE NO. 49262
 6 HUNTINGTON COURT
 WILLIAMSVILLE, N.Y. 14221
 PHONE 716 631-8041



Charles E. Denver

**REQUEST FOR
ACTION BY:
TOWN OF CLARENCE, N.Y.**

☒ Appeal Board
☐ Planning Board
☐ Town Board

☒ Appeal
☐ Rezone
☐ Revise Ordinance
☐ Subdivision
☐ Limited Use Permit
☐ Other

Rec'd. by: Planning and Zoning

Date March 27, 2015

Action Desired Applicant requests a variance of 22.5' to allow for a 22.5' greenbelt between a proposed commercial use and an existing residential use. Proposal relates to 5989 Transit Road, located in the Commercial Zone.

Reason Town Code Reference:
§229-87 (C) (4)

PLEASE PRINT

Name	Michael Metzger, PE		
Address	8560 Main Street,		
	Clarence	NY	14221
Town/City	State	Zip	
Phone	633-2601		
Signed	SIGNATURE ON FILE		

Requests for action on zoning should be filled out completely in above spaces if practicable; otherwise give brief description and refer to attached papers. The complete request with all necessary plans, maps, signatures, should be filed with the Secretary of the Planning Board. Requests (except appeals) may be filed with the Town Clerk or Town Board, but will generally be referred to Planning Board with subsequent loss of time.

Initial Action

Approved ☐
Rejected ☐ by on 20.....
Approved ☐
Rejected ☐ by on 20.....

Published (Attach Clipping) on 20.....

Hearing Held by on 20.....

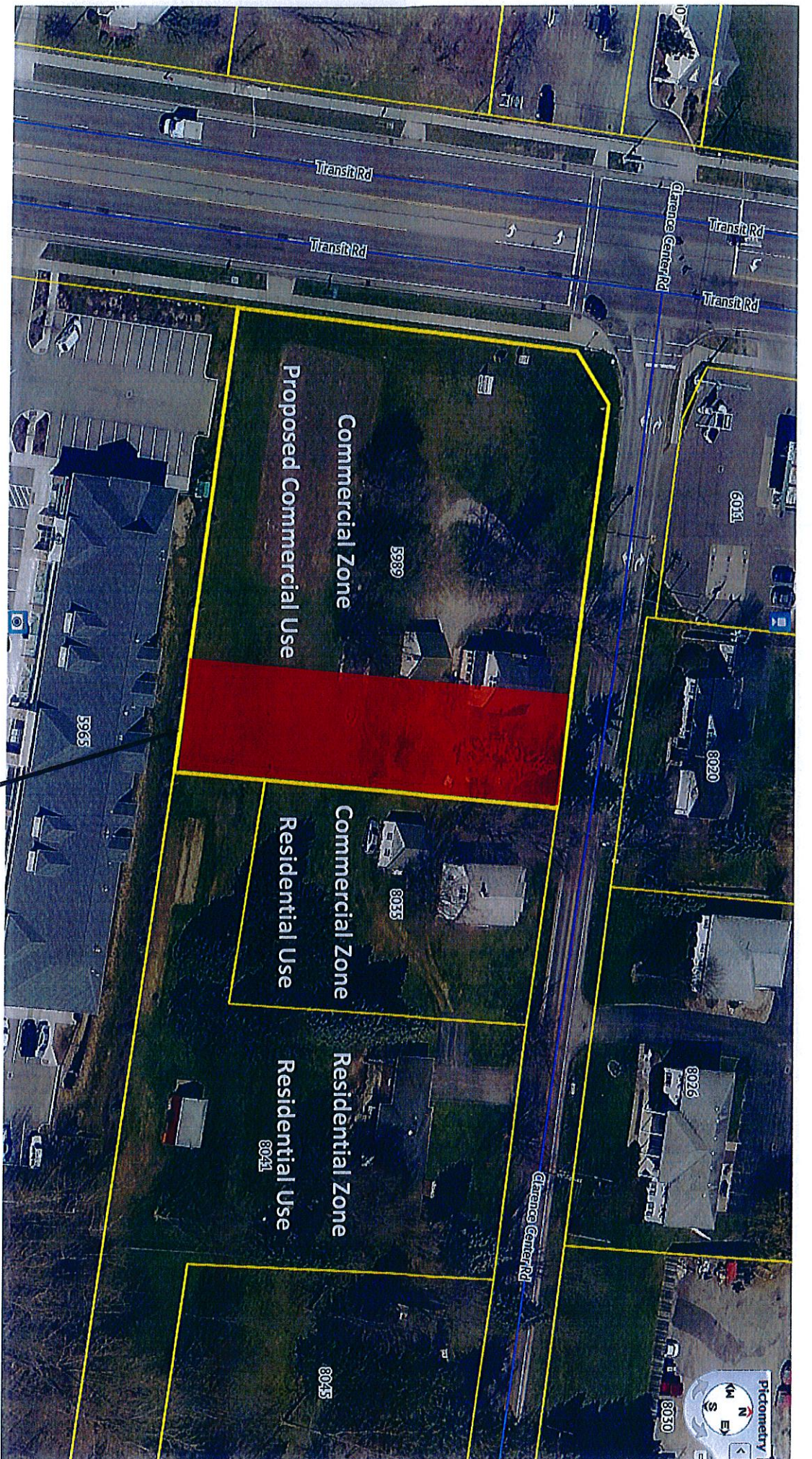
Final Action Taken

Approved ☐
Rejected ☐ by on 20.....

Published (Attach Clipping) on 20.....

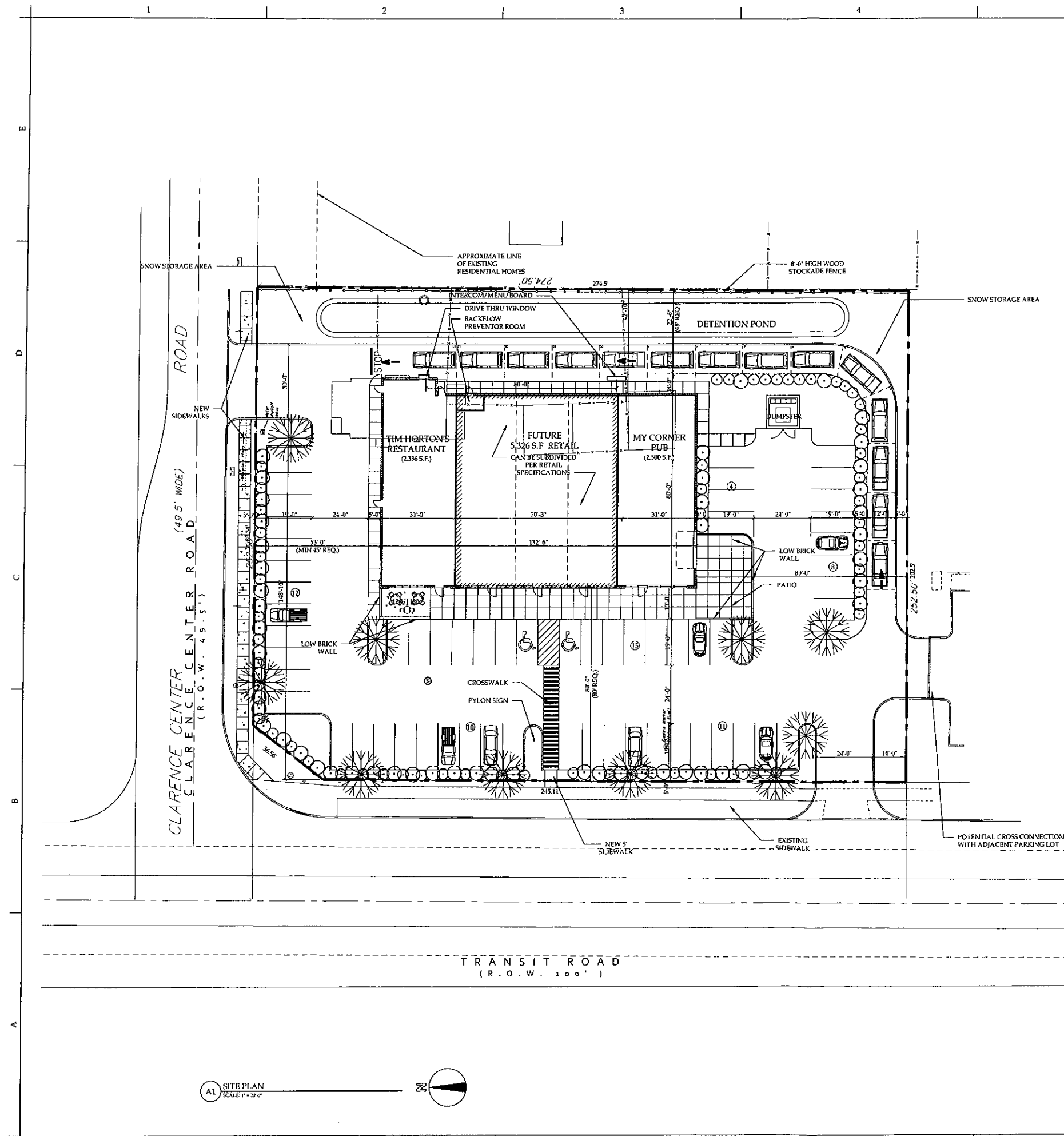
Filed with Town Clerk on 20.....

Filed with County Clerk on 20.....



* note the parcel lines displayed are approximate
5989 Transit Road

45' greenbelt required due to adjacent residential use



SITE DATA:

ZONED: COMMERCIAL
ACREAGE: 1.27 ACRES

TOTAL BUILDING AREA:
RETAIL - 5,576 S.F.
TIM HORTONS - 2,670 S.F.
MY CORNER PUB - 2,500 S.F.

TOTAL BUILDING AREA - 10,746 S.F.

SETBACK REQUIREMENTS

BUILDING:
FRONT - 80'
SIDE - 25'
REAR - 25'

PARKING REQUIREMENTS

RETAIL - 1 SPACE PER 150 S.F.
5,576 S.F. / 150 = 38 REQ. SPACES

TIM HORTONS DRIVE THRU - 1 PER 3 SEATS
20 / 3 = 7 REQ. SPACES

MY CORNER PUB - 1 SPACE PER 100 S.F.
2,500 / 100 = 25 REQ. SPACES

TOTAL SPACES REQUIRED - 70
TOTAL SPACES PROVIDED - 60 (VARIANCE REQUIRED)

VARIANCES REQUIRED:
1) PARKING VARIANCE (70 SPACES REQ., 60 PROVIDED)
2) 45' GREENBELT REQUIRED AT EAST PROPERTY LINE. 25'-6" PROVIDED

LOT COVERAGE:
42328.65 S.F. = 76%

SPECIAL EXCEPTION USE PERMIT REQUIRED:
SPECIAL EXCEPTION USE PERMIT REQUIRED FOR DRIVE THRU LANE AND PLAZA

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McGuire
Development Co.

**Proposed
Retail
Building**

5989 Transit Road
Clarence, NY

ISSUE:

SA PROJECT TEAM: PRINCIPAL P. Silvestri
PROJ. ARCH. _____ DRAFTER _____
JOB CAPT. _____ INTERIORS _____

SEAL:

TITLE:

Site Plan

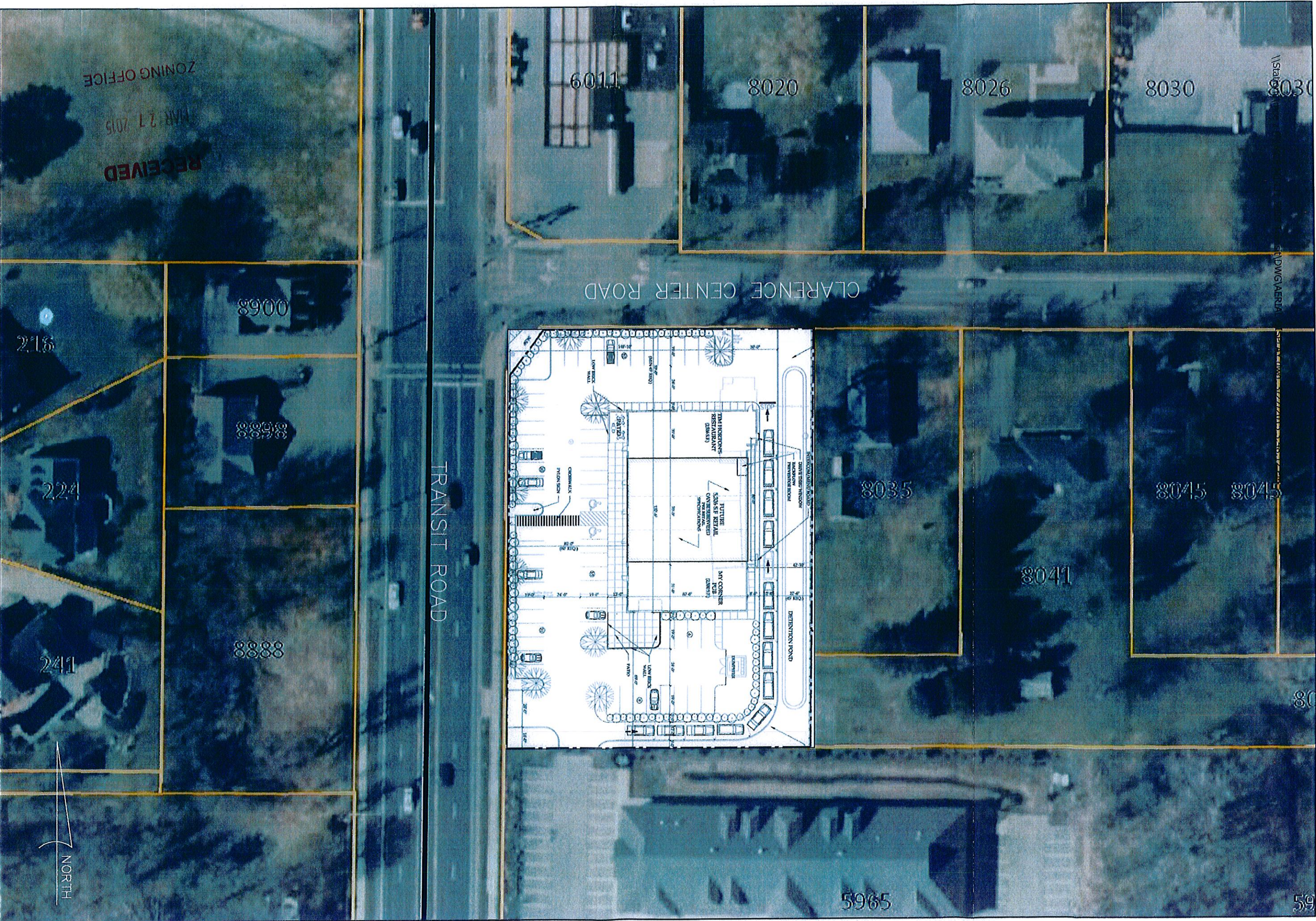
SILVESTRI
ARCHITECTS • PC

1321 MILLERSPORT HWY. PH. 715.691.0900
AMHERST, NY 14221 FAX 715.691.4773

SA JOB #: 11135-02
DATE: 03-11-15

DRAWING #: AS-101

A1 SITE PLAN
SCALE 1" = 32'
N



METZGER
CIVIL
ENGINEERING, PLLC

SCALE:	N.T.S.
DATE:	3.27.15
JOB NO:	M-1431
DESIGNED BY:	ARH

5989 TRANSIT ROAD
AERIAL DISPLAY